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Except as indicated, abstracts are by William H. Stickel, [illegible]

NATURAL RESOURCES & CLIMATE

Leopold, Luna B. WATER AND THE CONSERVATION MOVEMENT. US Geol. Surv. Cir. 402. 1-12 p. 1958. Free from Geol. Surv., Wash. 25, D. C.
Wise comments on the philosophy of conservation and learned discussion of our water problems.

Stefferud, Alfred, editor. LAND / THE 1958 YEARBOOK OF AGRICULTURE. US Dept. Agr. xi + 605 p., many (but unnumbered) plates and figures. 1958. $2.25, cloth, from Supt. Documents.
The scores of individually authored papers in this volume provide great amounts of information on land resources, use, and problems in the U. S. and its territories. Like the rest of its series, this book is a mine of information and a terrific bargain. A portion of the editor's preface describes the book better than we could: "We discuss the land that was here when the colonists came, its importance in our history and growth, the use and management of public and private lands, the income and valuation of land, resources and prospective needs, and emerging problems of ownership and control. We consider the profound changes these later days have brought, and we try to see what they mean in relation to our land resources: The growth of population and cities; the growth of the size of farms and the decline of the farm population (for land, used by people for people, has meaning only in terms of people); the use of millions of acres for highways, airports, factories, and subdivisions; the expanding number of part-time and residential 'farms' of those who want to live two lives in the country and the city; the difficulties of getting started in farming; the need for more group action as the problems exceed the scope of individuals. We present no ready program, no easy solution, and no definite policy... The suggestions presented here are personal...and there are conflicts and contradictions. That is all to the good, however..."

SOILS

Bell, A. P., and others. SOIL SURVEY OF CARROLL COUNTY, INDIANA. US Soil Cons. Serv., Ser. 1940, no. 23. ii + 67 p., illus. + large, colored, single-fold maps bound in. Nov. 1958. Sold by Supt. Documents.

Farnham, R. S., and others. SOIL SURVEY OF ISANTI COUNTY, MINNESOTA. US Soil Cons. Serv., Ser. 1953, no. 1. ii + 60 p., 9 figs. + colored, single-fold maps bound in. Sept. 1958. Sold by Supt. Documents.

Fox, C. J., and others. SOIL SURVEY OF FRANKLIN COUNTY, TENNESSEE. US Soil Cons. Serv., Ser. 1949, no. 8. ii + 91 p., 10 figs. + single-fold maps based on aerial photos and bound in. Nov. 1958.

Glassey, T. W., and others. SOIL SURVEY OF THURSTON COUNTY, WASHINGTON. US Soil Cons. Serv., Ser. 1947, no. 6. 1-79 p., illus. + large, colored single-fold maps bound in. Sept. 1958. Sold by Supt. Documents.

Goodman, K. V., and others. SOIL SURVEY OF POTTER COUNTY, PENNSYLVANIA. US Soil Cons. Serv., Ser. 1953, no. 2. iii + 101 p., 13 figs. + colored single-fold maps bound in. July 1958. Sold by Supt. Documents.

Leighty, Ralph G., and others. SOIL SURVEY OF HILLSBOROUGH COUNTY, FLORIDA. US Soil Cons. Serv., Ser. 1950, no. 3. ii + 68 p., 15 figs. + large single-fold maps based on aerial photos and bound in. Sold by Supt. Documents. Sept. 1958.

Sherard, Hoyt, and others. SOIL SURVEY OF MORGAN COUNTY, ALABAMA. US Soil Cons. Serv., Ser. 1944, no. 10. 1-192 p., 3 figs. + large, colored, folding maps. Sept. 1958. Sold by Supt. Documents.

Swenson, G. A., and others. SOIL SURVEY OF DE KALB COUNTY, ALABAMA. US Soil Cons. Serv., Ser. 1951, no. 3. ii + 108 p., 9 figs. + single-fold maps based on aerial photos and bound in. Sept. 1958. Sold by Supt. Documents.

Walker, J. H., and others. SOIL SURVEY OF FULTON COUNTY, GEORGIA. US Soil Cons. Serv., Ser. 1949, no. 7. 1-79 p. + large single-fold maps based on aerial photos and bound in. Dec. 1958. Sold by Supt. Documents.

SOILS--Continued

Westin, F. C., and others. SOIL SURVEY OF BROOKINGS COUNTY, SOUTH DAKOTA. US Soil Cons. Serv., Ser. 1955, no. 3. ii + 87 p., 47 figs. + single-fold maps based on aerial photos and bound in. Jan. 1959. Sold by Supt. Documents. Also issued as S. Dak. Exp. Sta. Bul. no. 468.

CONSERVATION EDUCATION

Bathurst, Effie G., and Wilhelmina Hill. CONSERVATION EXPERIENCES FOR CHILDREN. US Dept. Health, Ed., and Welfare, Office Ed., Bul. 1957, no. 16. vi + 192 p., illus. 1957. 75¢ from Supt. Documents.

"This bulletin describes many ways of helping children have real and meaningful experiences in the conservation of natural resources. The contents are based on a study of conservation education in the elementary schools of twenty-eight states. Included are examples and illustrations of working with soil and water, tree planting, developing nature trails, and protecting wildlife." Includes suggestions on preparation of teachers and sources of information.

Giles, Robert H., Jr. (V.P.I., Agr. Ext. Serv., Blacksburg, Va.) CONSERVATION KNOWLEDGE OF VIRGINIA SCHOOL PUPILS. Va. Poly. Inst. Agr. Ext. Serv., Bul. 257. 1-41 p., 5 graphs, 1 map. Aug. 1958.

"A recognition type objective test with 100 multiple response questions was prepared and administered to 15,443 Virginia public school pupils...in grades 6 through 12...to determine pupils' knowledge of certain principles of renewable natural resource conservation in general, soil, forest, water, and wildlife conservation, and the source of this knowledge. After normal appraisal procedures, the test was declared to be logically and statistically sound." The av. score was below a desirable level (54.8 of a possible 100). Av. grades were higher in each higher grade, but rate of increase was inadequate; rate of increase declined after 9th grade. Greatest knowledge was in general conservation, least in wildlife conservation. Caucasian pupils had significantly higher scores than Negroes; av. total scores from n. part of state were significantly higher than those from s. or central areas. Farm children had significantly less knowledge than urban or suburban pupils. Recommendations were prepared for improvement of the conservation education program. The booklet contains a list and brief explanation of the 100 principles of conservation that were tested and also a copy of the test.--L. F. Stickel.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY. HISTORY

Blanchard, J. R., and H. Ostvold. LITERATURE OF AGRICULTURAL RESEARCH. U. Calif. Press, Berkeley. x + 231 p. 1958.

Primarily lists bibliographies, abstracting journals, indexes, encyclopedias, dictionaries, handbooks, etc. Wildlife and fisheries literature is considered, but quite inadequately.--V. Schultz.

Gelfand, David P. A DIRECTORY OF MEDICAL AND BIOLOGICAL RESEARCH INSTITUTES OF THE USSR. U. S. Public Health Serv. Publ. no. 587. vi + 340 p. 1958. [Single copies available, while limited supply lasts, from Publications & Reports Section, Scientific Reports Branch, National Institutes of Health, Bethesda 14, Md.]

A geographically arranged address list of more than 700 research institutes and their subdivisions. It includes a general subject and name index. The volume should be extremely helpful in arranging exchanges of persons and publications. Emphasis is, of course, on medical organizations, but botanical and zoological institutes and branches are listed. Seldom, however, can one tell whether a given subject such as mammalogy, wildlife, or the like is studied in an organization named, so the list is of limited value for non-medical purposes. We attempted to list from this paper the organizations that might be significant to readers of WR, but had to give up because we could not tell about many of the organizations listed.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY--Continued

Gillese, John Patrick. THE WILDLIFE JOURNALS OF WILLIAM ROWAN. Beaver 289: 46-53, 10 figs. Autumn 1958.
The famous Canadian wildlife biologist Wm. Rowan was best known for his studies of the 10-year game cycle, but he was a man of many talents and many interests as well as being a devoted field biologist. This article on his life and work quotes extracts from his journals, reproduces some of his fine photographs and drawings, and shows the influence that Rowan had on the development of wildlife management and legislation in Alberta.

Sakata, Carl T. LIST OF INFORMATIONAL LEAFLETS ON WILDLIFE. US F&WS, Wildl. Leafl. 378/3M. 1-3 p. Nov. 1958.
A list of some wildlife publications that are currently available on request from the Fish & Wildlife Service. It includes both printed and processed material.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Aberdeen, J. E. C. (U. Queensland, Brisbane, Australia.) THE EFFECT OF QUADRAT SIZE, PLANT SIZE, AND PLANT DISTRIBUTION ON FREQUENCY ESTIMATES IN PLANT ECOLOGY. Australian J. Bot. 6(1): 47-58. 1958. [From Biol. Abst. 32 (10).]
See abstract in Biol. Abst. 32(10).

Keith, Lloyd B. (Dept. Wildl. Mgt., U. Wis.) SOME EFFECTS OF INCREASING SOIL SALINITY ON PLANT COMMUNITIES. Can. J. Bot. 36(1): 79-89, illus. Jan. 1958.
Soil salinity has increased and salt plants have replaced mesic prairie plants on peripheries of 2 new impoundments (4 and 8 years old) in s. Alberta. --Neil Hotchkiss.

McIntosh, Robert P. (Notre Dame U., Ind.) PLANT COMMUNITIES. Science 128(3316): 115-120, 5 figs. July 18, 1958.
Data reviewed here indicate that "The order inherent in nature is not...one of clear-cut cause and effect relationships resulting in well-defined aggregations of species into clearly bounded and readily pigeonholed units as objective natural entities. Much recent evidence points toward the concept of communities as an ordered pattern of species, individually distributed in space and time and most effectively considered in terms of orders and gradients."

Olson, Jerry S. (Conn. Agr. Exp. Sta., New Haven.) RATES OF SUCCESSION AND SOIL CHANGES ON SOUTHERN LAKE MICHIGAN SAND DUNES. Bot. Gaz. 119(3): 125-170, illus. 1958. [From Biol. Abst. 32(10).]
See good abst. in Biol. Abst. 32(10).

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Ahlgren, I. F., and C. E. Ahlgren. (Quetico-Superior Wilderness Res. Center, Ely, Minn.) A KEY TO THE NATIVE CONIFEROUS TREE SEEDLINGS OF THE QUETICO-SUPERIOR AREA. J. For. 56(12): 911-912. Dec. 1958.

Argus, George W. THE WILLOWS OF WYOMING. U. Wyo. Publ. 21(1): 1-63, illus., maps. 1957. [From Biol. Abst. 32(12).]
The general characters of willows and their uses are reviewed, with a historical summary. A key is given which may be used by people with a limited knowledge of botany, as it is supplemented by a glossary and photographs. The systematic treatment includes detailed synonymy, descriptive and distribution notes, and maps for 31 species of Salix known to occur in Wyo., with additional varieties.

Burlison, V. H., R. L. Guernsey, and F. D. Johnson. (U. Idaho, Moscow.) TREES OF IDAHO. U. Idaho (Moscow), Agr. Ext. Serv., Bul. 289. 24 p., illus. June 1958.

Popular, well-illustrated booklet on recognition, growth habits, and uses of 23 conifers and 20 broadleaf trees. For a few groups, including Salix, not all species are treated. The pamphlet should be useful, however, for many field purposes and for extension. Serious identification work would require more technical references, some of which are cited in this paper.

Cooperrider, Tom S. THE FLORA OF CLINTON, JACKSON, AND JONES COUNTIES, IOWA. Ph.D. thesis, U. Iowa. 348 p. 1958. [From longer abstract in Dissertation Abstracts 19(3).]

"...contains a discussion of the previous collecting in the area, the literature on its flora, the location and extent of the area, its geological history, its topography, drainage, soils and climate, and a discussion of the relationship between physical geography and distribution of some plant species and communities within the area. The well-defined plant communities are described and their component species listed. An annotated catalogue of the species of vascular plants is presented which gives the name, habitat(s), and relative frequency of each species as well as complete collection data for rare species and partial data for all other species." Taxonomic problems are discussed.

Lehr, J. Harry. (75 Herrick Ave., Spring Valley, N. Y.) AN ANNOTATED PRELIMINARY CATALOGUE OF THE VASCULAR FLORA OF ROCKLAND COUNTY, NEW YORK. Bul. Torrey Bot. Club vol. 83, p. 435-438, 1956; vol. 84, p. 48-56, 126-134, 206-213, 310-317, 388-392, and 450-452, 1957. Reprint paged 1-39, Dec. 1957, $1.00 from author.

List presents scientific and common names and gives brief indication of distribution in county for each species. The list is of special value as Rockland Co. is just outside N. Y. City and is being suburbanized rapidly.

Petrides, George A. (Mich. State U., E. Lansing.) A FIELD GUIDE TO TREES AND SHRUBS. Houghton Mifflin Co., 2 Park St., Boston 7, Mass. 431 p., illus. 1958. $3.95. [From review by C. C. Steirly, Raven 29(11/12).]

Steirly, a forester and ornithologist, enthusiastically recommends this new number of the Peterson field guide series. The region covered is from the s. border of Va. northward and "west to the prairies." Plants are arranged in such groups as "Broad-leaved plants with opposite compound leaves," rather than in systematic order. Illustrations are arranged in the same way and are in the center of the book. "The drawings are somewhat diagrammatic and in general for each species the leaf, twig and bud are depicted. In Peterson Guide fashion, indicating arrows point to the significant identification features. Where appropriate as a means of identification the fruits are shown. Brief accounts of each species are given under the headings Recognition and Similar Species. General dates of flowering and fruiting are given and where appropriate there is a statement under Remarks covering uses, timber quality, etc. A section on tree silhouettes is useful. Leaf types and twig and bud terminology are dealt with diagrammatically and the appendix contains two very useful keys, one to the winter characteristics and one to the trees when in leaf. A glossary of botanical terms and a brief section on plant relationships conclude the book."

Rowell, Chester M. (Texas Tech. Coll., Lubbock.) SUMMER FLORA OF THE GENE HOWE WILDLIFE MANAGEMENT AREA, HEMPHILL COUNTY, TEXAS. SW. Nat. 2(4): 155-171. 1957. [From Biol. Abst. 32(10).]

St. John, Harold. (State Coll. Wash., Pullman.) FLORA OF SOUTHEASTERN WASHINGTON AND OF ADJACENT IDAHO. (Revised edition) Students Book Corp., Pullman, Wash. xxv + 561 p., illus. 1937, revised 1956. $4.25. [From review by Joseph Ewan, Quart. Rev. Biol. 33(2).]

Revised, offset edition of a highly useful flora. The old text is unchanged and new material is presented in a 28-p. section at the back of the book. The volume contains technical keys, descriptions, and glossary. It should be of great value to persons who have had the usual training in systematic botany. Illustrations, however, are limited to 1 map and a few line drawings in the key to families.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

Van Bruggen, Theodore. THE FLORA OF SOUTHCENTRAL IOWA. Ph.D. thesis, U. Iowa. 509 p. 1958. [From abstract in Dissertation Abstracts 19(3).]

"...represents a systematic enumeration of the native and adventive vascular plants known to grow spontaneously in the southcentral part of Iowa. The counties comprising this area are: Clarks, Dallas, Decatur, Jasper, Lucas, Marion, Polk, Warren, and Wayne."

PLANTS--FOREST SURVEYS

Minnesota. THE FOREST RESOURCE OF CENTRAL MINNESOTA. Office of Iron Range Resources and Rehabilitation, 624 State Office Bldg., St. Paul 1, Minn. 1-48 p., 7 figs. 1958?

Provides data on area and ownership, timber types and volumes, drain, forest industries, growth, and allowable cut. Counties in the area are: Anoka, Benton, Carver, Chisago, Dakota, Douglas, Hennepin, Isanti, Kanabec, LeSeuer, Mille Lacs, Morrison, Ottertail, Ramsey, Rice, Scott, Sherburne, Stearns, Todd, Washington, and Wright.

WILDLIFE--NEW GAME SERIES

BULLETIN OF SCIENTIFIC AND TECHNICAL INFORMATION (Biulleten' Nauchno-Technicheskoi Informatsii). Number 5, 1-47 p., illus., 1957 (Jan. 1958). Editor, I. A. Golubeva. Published by All-Union Scientific Research Institute of Forestry and Mechanization of the Forest Industry (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Lesovodstva i Mekhanizatsii Lesnogo Khoziaistva), Moscow, U.S.S.R.

A true wildlife management series despite the enigmatic title. The Bulletin "is dedicated to the problems of wild life management referred to sport and relation between forest and wild life management." We do not know how often it appears, but there are indications that it appears annually or occasionally. Two thousand copies of this issue were printed, which suggests rather wide distribution. All papers have English summaries, but these are short, indicative, and hardly more informative than the following notes on individual papers. The first paper describes the newly formed Department of Wildlife Management in the Institute and discusses its goals. The Department will function in the European part of the USSR, mainly in the forest zone. The second paper discusses "the prospects and tasks of Wild Life Management in the USSR." Third paper takes up "conditions and measures on settling of game animals for sport purposes in the regions of middle zone of the European part of the USSR. It is pointed out that for successful settling of game animals the natural conditions must provide the prosperity of game animals." Fourth paper tells briefly "the minimum sizes of practical measures which are possible to carry out by the personnel of the state forests..." for benefit of wild animals. Fifth paper discusses moose damage to forests. The problem and its severity vary greatly with local conditions and with moose density; control measures must vary accordingly. Sixth paper is short account of importance of helminthological research in wildlife management. Author points out that simple, practical prophylactic measures can be carried out on game ranges. Seventh paper is on artificial propagation of Perdix perdix. Eighth paper is a brief review (5 p., 6 refs.) of North American methods for determining carrying capacity of ranges for hoofed animals.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Barabash-Nikiforov, I. I. NEW DATA CONCERNING THE RAPID SETTLEMENT OF A NUMBER OF SPECIES OF WILD ANIMALS DURING THE LAST DECADE. Zool. Zh. 35(2): 304-310. 1956. [From Biol. Abst. 32(10), from Referat. Zh., Biol. 1957, No. 10931.]

In Russian. Deals with numerous range extensions or reestablishments of game and fur animals in Russia in recent years. See long abst. in Biol. Abst. 32(10).

Buzzati-Traverso, A. A., editor. PERSPECTIVES IN MARINE BIOLOGY. U. Calif. Press. xvi + 621 p., illus. 1958. $10.00.

This book is based on an international symposium held at Scripps Inst. Oceanog., Calif., in 1956. Chief goal was to illuminate fields of marine research that could be attacked by experiment. Papers are technical but unusually interesting and stimulating. Discussions are also reported. Part I, on ECOLOGY, consists of 13 papers. One of these is An attempt to test the efficiency of ecological field methods and the validity of their results, by R. Riedl. Part II, PHYSIOLOGY AND BIOCHEMISTRY, contains 12 papers, 2 of which are: Perspectives in the study of biological clocks, by C. S. Pittendrigh, and Studies of the timing mechanisms of daily, tidal, and lunar periodicities in organisms, by F. A. Brown, Jr. Part III, BEHAVIOR, consists of 4 papers: Ethology as a new branch of biology, by W. H. Thorpe; Polarized light and plankton navigation, by T. H. Waterman; Perception of pathways by fishes in migration, by A. D. Hasler; and Perspectives of experimental research on social interference among fishes, by D. Miyadi. Part IV includes 12 papers on GENETICS AND EVOLUTION.

Crisler, Lois. ARCTIC WILD. Harper & Bros., 49 E. 33d St., N. Y. 16, N. Y. xx + 301 p., 65 photos. 1958. $4.95. [From long review by Howard Zahniser, Nat. Mag. 51(10).]

Herb and Lois Crisler went to the Arctic to make pictures for Disney's "White Wilderness." Their prolonged observations and intimate contact with animals, some of which they reared, enabled them to gain remarkable insight into animal behavior and sociology. Some of their findings on wolves and caribou are already well known from popular or technical articles. Mrs. Crisler's book not only provides much information about animals, but is a vivid esthetic appreciation of the arctic wilderness itself. Zahniser's review quotes a number of excerpts.

Curry-Lindahl, Kai. (Nordiska Museet & Skansen, Stockholm, Sweden.) ZOOGEOGRAPHY, POPULATION DYNAMICS AND RECENT FAUNAL CHANGES [in Sweden]. Ymer 1958(1): 5-57, 33 maps. 1958.

In Swedish with 2.5-p. summary and legends in English. A good interpretation, with helpful maps, of the present vertebrate fauna of Sweden. All of the country was covered by glaciers some 14,000 years ago, so nearly all of the fauna is of recent arrival. The author analyzes faunal elements, invasion routes, refugia, relicts, and present migration patterns. He considers current distribution in relation to climate, and he shows how ranges and populations of many forms have contracted or expanded in historical times. Lynx, badger, and roe deer are among the animals that are increasing or reinvading their former ranges today. Increase and spread of roe deer is especially noteworthy.

Fitch, Henry S. (U. Kans., Lawrence.) HOME RANGES, TERRITORIES, AND SEASONAL MOVEMENTS OF VERTEBRATES OF THE NATURAL HISTORY RESERVATION. U. Kans. Publ., Mus. Nat. Hist., 11(3): 63-326, 24 figs., 6 pl. Dec. 1958.

A valuable contribution to knowledge of field biology of vertebrates of the U. Kans. Nat. Hist. Reservation. Natural history data are organized by species under the headings of status, habitat, and movements. The book thus provides a checklist as well as a summary of knowledge of local species. Methods of study, habitats, and abundance of species are included in the introduction. The list of the most common animals is annotated to include specific data concerning their numbers. Certain animals were the subject of special population studies by the author and others working at the reservation and sections concerning them are particularly valuable. Travel behavior is emphasized; many of the species accounts include data from mark-and-release studies. A discussion of types of behavior related to range and territory is included in the section containing summary and conclusions.--L. F. Stickel.

Hedgpeth, Joel W., editor. TREATISE ON MARINE ECOLOGY AND PALEOECOLOGY. VOLUME 1: ECOLOGY. Geol. Soc. Am., N. Y., Mem. 67. viii + 1296 p., illus. 1957. $12.50. [From review by J. E. Fitch, Calif. Fish & Game 44(4).]

Should be within easy reach of everyone working with marine organisms. Hollywood superlatives do not do it justice; one has to see the volume. Some 60 authorities have contributed 29 chapters of text and 36 sections of annotated bibliography. Text is relatively easy to read, is well organized and well indexed. "A classification of marine environments is presented in an early chapter... Grouped nearby are chapters on the concepts of ecology and the obtaining of ecological data. These are followed by discussions on the various physical, chemical, and ethereal factors affecting or capable of affecting marine ecology: solar radiation, lunar periodicity, salinity, temperature, oxygen, carbon dioxide, nutrient elements, etc." Much excellent material appears in chapters "discussing major habitat types and the ecological niches contained therein. These chapters [are] on bottom communities, rocky intertidal surfaces, sandy beaches, coral reefs, submarine canyons, deep sea and abyssal depths, and estuaries and lagoons... Contributions on fluctuations in littoral populations and mass mortalities in the sea contain important data and more than 100 pages (of fine print) are devoted to annotated bibliographies of all of the major marine groups and phyla. All of those associated with the publication of this invaluable addition to the field of marine ecology are to be commended for their efforts."

Sankey, John. A GUIDE TO FIELD BIOLOGY. Longmans, Green & Co., N. Y., Toronto, London. 166 p., illus. 1958. $1.90. [From review by V. E. F. Solman in Can. Field-Nat. 72(4).]

"...a valuable source book for techniques for the study of soils, plants, and animals other than vertebrates. Although designed for use in the British Isles, the general nature of much of the text suits it for use in any temperate area." Principal sections: soils and soil formation; qualitative and quantitative study of plants; collection and study of animals, from soil microfauna through larger invertebrates, with a brief mention of some of the smaller mammals and birds; comprehensive surveys of plants and invertebrates; specific work projects; and bibliography.

WILDLIFE--NATURAL AREAS & REFUGES

Branch of Wildlife Refuges. ADDRESS LIST OF REFUGE MANAGERS - 1958. US F&WS, Wildl. Leafl. 397. 1-8 p. June 1958.

Fryer, J. D. (A.R.C. Unit Exp. Agron., Oxford.) SYMPOSIUM ON WEED KILLERS. THE POTENTIAL VALUE OF HERBICIDES IN NATURE RESERVES. Proc. Linn. Soc. London 169(1/2): 107-110. 1958. [From Biol. Abst. 32(12).]

Apparently a brief review with no new information or ideas. See abstract in Biol. Abst. 32(12).

Hagenstein, W. D., moderator. PANEL DISCUSSION OF WILDERNESS PRESERVATION. J. For. 56(12): 931-937. Dec. 1958.

Wildlife Review cannot cover the whole controversy over the proposed wilderness bill, but it can call attention to some of the better founded discussions. Here, for example, is a symposium of convenient length in which a variety of views is represented. Titles are: The background of wilderness legislation, by J. P. Gilligan. Comments in opposition to a national wilderness preservation system, by K. B. Pomeroy. Wilderness bill not in conflict with other interests, by Howard Zahniser. Professional practice should be permitted, by G. A. Craig. Some comments on the revised wilderness preservation bill, by H. R. Glascock, Jr. Summaries of informal discussions by speakers are presented.

Mountfort, Guy. WILD PARADISE / THE STORY OF THE COTO DOÑANA EXPEDITIONS. Houghton Mifflin Co., Boston. Publ. in Eng. under title "Portrait of a Wilderness" by Hutchinson & Co., Ltd. 240 p., 130 photos + text figs. 1958. $7.00.

English ornithologist Guy Mountfort vividly describes the wildlife of one of the last great wilderness areas of Europe, the Coto Doñana on the sw. coast of Spain. The vast (69,000 acres) relatively inaccessible area was maintained for 500 years as a shooting preserve of Spanish nobility, and is now preserved as a sanctuary. Past as well as present owners managed the area with care and concern for its wealth of wildlife. The author organized three expeditions, each composed of an impressive list of English, French, Spanish and American naturalists, to learn the population status of the birds, to examine ecological relationships, and to learn something of migratory movements through the Coto and the adjacent expanses of wilderness. Mountfort and Roger Tory Peterson reconnoitered the area in 1952. Full scale expeditions were in operation from mid-April to June in 1956 and 1957. Expert photographers Eric Hosking, Lord Alanbrooke, Roger Tory Peterson, and others of the expedition recorded many firsts. Hoskings's superb work illustrates this volume. The three expeditions recorded 193 species of birds, not including autumn migrants. The Coto is a major flyway between the west coast of Europe and n. Africa, and nearly half of the bird species of Europe are found there. Nine species of true larks were found, including the Indian Sand Lark, Calandrella raytal, an Asiatic species, and one not only new to Spain, but to the whole of Europe. Twenty-seven of Europe's 38 species of birds of prey have been seen on or very near the Coto Doñana. Flamingos, herons and other waterfowl inhabit its tremendous expanses of marshland. Red and fallow deer, lynx and wild boar roam the vast brushy plains. The text of this unusual book is thoroughly readable. Appendices list birds, mammals, and herptiles.--Brooke Meanley.

Rudd, Clayton G., editor. ALLURING BORDER COUNTRY--SECTION ONE. Naturalist 9(3): 1-32, illus. Fall 1958. $1.00.

Beautifully illustrated issue on the Quetico-Superior country. Articles by experts tell of the history of the preservation of the area, early travels, pictograph hunting, birds, state forests and their history in the region, and of enjoyment of the region today.

Shanklin, John F., committee chairman. REPORT OF THE COMMITTEE ON NATURAL AREAS. J. For. 56(12): 943-945. Dec. 1958.

This report suggests many ecological, botanical, and zoological problems that could be studied on specific natural areas. Natural areas are not receiving anything like the amount of study they should; we should all try to take more advantage of them for research and education.

Transvaal. FAUNA & FLORA NO. 7. Govt. Printer, Pretoria. 139 p., illus. 1956 (1958). Available from Director of Nature Cons., P. O. Box 383, Pretoria, S. Africa. No price stated.

This issue, in both English and Afrikaans, is devoted to the remarkable nature sanctuary of Wonderboom at Pretoria. Separate papers tell of the history, geology, botany, and archeology of the reserve. Other papers list and discuss the reptiles and amphibians, birds, and mammals.

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Hurcomb, The Rt. Hon. Lord, editor. HYDRO-ELECTRICITY AND NATURE PROTECTION / STATING THE CASE. Internatl. Union Prot. Nat. (31 rue Vautier, Bruxelles, Belg.), Pro Natura vol. 2. 1-224 p. 1955. Price not stated.

One of the main topics at the 1952 meeting of the International Union for the Protection of Nature was the conflict between hydroelectric developments and nature conservation. Sixty papers on this subject were delivered at the Caracas meeting by authorities from many parts of the world. Twenty-five of the papers are reproduced here and all 60 are represented at least by summaries. Papers are in English or French; summaries of French papers are in English, and vice versa; papers represented only by summaries are in both languages. This volume is the chief reference on its subject and includes pertinent resolutions passed by the Union.

Stracey, P. D. ON THE STATUS OF THE GREAT INDIAN RHINOCEROS (RHINOCEROS UNICORNIS) IN NEPAL. J. Bombay Nat. Hist. Soc. 54(3): 763-766, illus. 1957. [From Biol. Abst. 32(12).]

A maximum population estimate for this animal in Chitawan area is 500 to 600 and 100 in Nawalpur area. A multiple-use land program threatens to restrict this species to a density of 1.5 rhinos/sq. mi. Increased poaching continues to make serious inroads in the population despite a large and efficient protection force.--W. E. Fahy.

Treichel, George. (N. Y. Zool. Soc., 30 E. 40th St., N. Y. 16, N. Y.) AFRICA--AND OUR WILDLIFE HERITAGE. Animal Kingdom 61(6): 162-168, 5 photos, map. Dec. 1958.

First of a series of reports on 1.5 yrs. in S. Africa on behalf of N. Y. Zool. Soc. and Cons. Found. "The future of...most outstanding faunal areas in Africa, is precarious...for...three reasons: Rapidly expanding indigenous populations requiring a little more land each year; Rising African nationalism, which in time may eliminate the Europeans...The customary degree of colonial administration apathy in matters relating to wild animal conservation outside of the major national parks." The popular image of Africa overrun by wild animals is not true; most native children have never seen a lion, a hippopotamus or a rhinoceros. The most urgent need is education of native people and leaders to the importance of wildlife conservation and preservation of natural areas. Many persons believe this to be impossible, but without it the areas and their herds will certainly disappear in the decades ahead.--L. F. Stickel.

Wynter-Blyth, M. A. THE LION CENSUS OF 1955. J. Bombay Nat. Hist. Soc. 53 (4): 527-536, map. 1956. [From Biol. Abst. 32(12).]

The length and breadth of the front pugmarks are used in making the census, to avoid duplication. Since identical census methods were used in 1950, the writer concludes that there has been sizable increase in lions and recommends 5 or 6 permits per annum for shooting lions, as an experimental measure. Check counts would be made, perhaps annually, to determine the trend in populations. At present lions are fully protected in Saurashtra.--C. W. Quaintance.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Fry, F. E. J. (U. Toronto, Ont.) TEMPERATURE COMPENSATION. Ann. Rev. Physiol. 20: 207-224. 1958.

Technical review of literature concerning physiology of adjustment and regulation of body temperature. 205 references.

Koskimies, Jukka. SNOW COVER AS HEAT INSULATOR. Suomen Riista 12: 137-140. 1958.

In Finnish with English summary on separate mimeo. sheet. Statistically designed experiments to measure heat loss from heated aluminum cans showed that relative heat loss below snow av. about half that in air. The difference was greatest at and shortly after midnight.

Tinbergen, Niko. CURIOUS NATURALISTS. Country Life Ltd., London. (British Book Centre, N. Y.) 280 p., illus. 1958. $8.75. [From review by A. J. Meyerriecks, Mass. Aud. 43(2).]

"Professor Tinbergen...tells us about the 'origin and evolution' of an ethologist--himself... We are told of the author's first simple, but ingenious, experiments in the field on the orienting ability of the bee-killing wasps of Hulshorst, a beautiful glacial sand area in central Holland; of the pack territories of Greenland huskies...; the 'reversed' behavior of the female phalarope, and so on through sixteen highly informative and simply written chapters. The photographic illustrations are not only unusual for their aptness and beauty, but also because many of them show how the ethologist operates in the field. Too often we are told only the results of a study, while the valuable (and frequently as interesting) techniques are barely mentioned. For those who wish to pursue the many investigations mentioned in the text, a useful list of references follows the final chapter. Highly recommended."

Williams, C. B. INSECT MIGRATION. The New Naturalist Series, Collins, London; Macmillan Co., N. Y. xiii + 235 p., 8 col. pl., 16 black-and-white pl., 49 figs. 1958. $6.00.

Few of us have any idea of the extent and importance of migration among insects. This fascinating, highly authoritative book demonstrates that migration on a large scale commonly occurs in many species of several insect groups. Migration, of course, implies seasonal flights to and fro. Williams, a leader in the field, brings together all that is known of this subject and integrates it with discussion of outbreaks, orientation, causation, migratory "forms" of insects, historical records of insect migrations, insect migration in Britain, personal experiences, and methods of study. Methods of marking insects for study of migration are well treated, and systems for collecting information are described. The book has a bibliography and index and otherwise is wholly suitable for scientific reference, but it contains much unusual information and is so written that it could be read by any interested person. Workers interested in migration of birds might find valuable comparative information here.--R. T. Mitchell.

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Baker, Maurice F. (Ala. Poly. Inst., Auburn.) FIRE ANT A WILDLIFE MENACE? Va. Wildl. 19(11): 27. Nov. 1958.

"The proponents of the fire ant eradication program have used Stoddard's information concerning the native fire ant and its effect upon quail, increased his figure by over 300 percent and applied them directly to the imported fire ant with no basis whatsoever in fact. To my knowledge there has been no detailed investigation of the relationship between the imported fire ant and any game species. This I do know for a fact, that in south Alabama and northwest Florida we are able to have excellent hunting and bobwhite populations coexistent with heavy populations of the imported fire ant. Also that in the almost 40 years that south Alabama has had the fire ant, game populations have shown a steady and very substantial increase. Certainly, if the imported fire ant were a serious menace to wildlife, these conditions could not exist."

Gabrielson, Ira N. (Wildl. Mgt. Inst., Wire Bldg., Wash. 5, D. C.) PESTICIDES, BLESSING OR CURSE? Am. For. 64(11): 4-5, 40-41, 1 photo. Nov. 1958.

Reviews the insecticide problem and tells of heavy wildlife losses in several recent control programs. Immediate effects are drastic and alarming. Cumulative, long-term results may be even worse, but little is known about them. Dr. Gabrielson urges every state fish and game administrator to push all possible work on insecticide damages. The Federal government cannot cover the whole field. Game, health, and agricultural agencies in each state should cooperate to the fullest to adjust control work for minimal damage. If this does not succeed, suitable legislation should be sought. Laws of too few states provide protection for wildlife against indiscriminate use of dangerous poisons.

George, John L. (Patuxent Refuge, Laurel, Md.) THE PROGRAM TO ERADICATE THE IMPORTED FIRE ANT / PRELIMINARY OBSERVATIONS. Conservation Foundation, 30 E. 40th St., N. Y. 16, N. Y. viii + 39 p., mimeo. July 1958.

The author attempts a balanced critique of the program on the basis of published information and numerous interviews on the scene. He describes history and biology of the ant; discusses planning, operation, and costs of the program; reviews economic status of the ant; considers effects of the program on agriculture and wildlife; and makes recommendations. The imported fire ant appears to be more of a nuisance than a major pest. The damage it does has been overdrawn. The ant feeds mainly on insects and the like, and is considered beneficial in Argentina. No one has demonstrated that it is a serious crop pest in the U. S. Indeed, it can hardly be starved into eating crop plants other than okra. No one has shown that the ant is a menace to quail, and authorities do not believe that it is. The potent poisons being used for control may kill great quantities of wildlife over huge areas, and they remain active for at least 3 years. Some studies already have shown extremely heavy kills of birds and other wildlife, and significant losses of livestock have been attributed to the program. The campaign will take 25 years and at least $125 million to treat the infested area one time, and retreatments almost certainly

will be needed in many places, owing to reinfestation and omissions in treatment. Meanwhile, resistance to chemicals may well build up, and new pests may appear because of disruption of natural controls. The author recommends basic studies to find other methods of control, and thorough study of results of treatment on the environment. While these studies are under way, aerial application might well be abandoned in favor of ground application, which would be restricted to cropland throughout the ant's range and to the periphery of the range. Seven-page list of references.

Graham, R. J., and David O. Scott. (Mont. Game Dept.) EFFECTS OF FOREST INSECT SPRAYING ON TROUT AND AQUATIC INSECTS IN SOME MONTANA STREAMS. Mont. Fish & Game Dept., Final Rep. PR Proj. F-21-R. iii + 32 + 18 p., 15 figs., 3 maps. Apr. 1958.

Fish and fish-food organisms were studied in 13 mountain trout streams to find the effects of an aerial spray of 1 lb. DDT per acre that was applied in 1956 for control of spruce budworms. Bottom-living invertebrates and adult insects were materially reduced; trout gorged themselves on the dead insects, but no dead trout were found. DDT was present in tissues of trout after 16 months. Trout fed on terrestrial insects and midge-fly larvae when the bottom fauna was depleted. In the 2 streams that were studied intensively, fish numbers declined slightly between Aug. 1956 and Aug. 1957; the reason was not certainly known. Fish populations in 3 streams were about the same in each year. Fish in 2 other streams declined 70% and 80% between the 2 years, presumably as a result of the DDT treatments. Suggestions are made for spraying procedures that will help reduce damage to fish.--L. F. Stickel.

Helminen, Matti. THE EFFECT ON PHEASANTS OF AN ARSENIC-CONTAINING PLANT PROTECTANT. Suomen Riista 12: 173. 1958.

In Finnish with English summary on separate mimeo. sheet. Test of Foliatox on potato foliage showed no adverse effect on pheasants in large pen, perhaps because of avoidance. [Composition of Foliatox is not stated in summary and we have not been able to find out through US Dept. Agr. It may be sodium arsenite.]

Helminen, Matti. PESTICIDE PROBLEMS IN FINLAND. Suomen Riista 12: 141-148. 1958.

In Finnish with English summary on separate mimeo. sheet. Use of pesticides is almost entirely limited to agriculture. Agricultural pesticides sold in 1956 contained a total of 8.6 tons of parathion, 1.2 tons of malathion, 7.2 tons of DDT, and 0.5 ton of lindane. Highest amounts used per unit area seemed to be distinctly below critical values for birds and mammals. Neither aldrin nor dieldrin was used. Sodium arsenite used in potato growing may give the most danger in future.

Hoffmann, C. H. (Ent. Res. Div., Agr. Res. Serv., US Dept. Agr.) THE TRUTH ABOUT CHEMICAL CONTROLS. Am. For. 64(11): 12-13, 35-38, 2 photos. Nov. 1958.

The chemical controls Dr. Hoffmann talks about here are the relatively light DDT doses (usually 1 lb. per acre) that are applied aerially to forests. These treatments are decided upon only after careful study, and their use has saved large amounts of timber. Effects on terrestrial wildlife have been slight. Effects on fishes and their food supplies have varied from slight to serious, depending on conditions. Damage is exaggerated by some individuals and groups that are opposed to all use of insecticides in the wild. There is damage, however, and it requires more and better study. Less dangerous insecticides are needed. Aerial application should be well controlled to avoid errors. Water areas should be avoided. Programs should be explained in advance to the public. Entomologists should join forces to explain and defend their control programs.

Iyatomi, Kisabu, and others. (Nagoya U., Anzyo, Japan.) TOXICITY OF ENDRIN TO FISH. Prog. Fish-Culturist 20(4): 155-162, 4 figs. Oct. 1958.

Good quantitative report of experimental studies.

Müsslein, F., and E. v. Xylander. (Inst. Jagdkunde, Hann. Münden, Ger.) FIELD MOUSE CONTROL AGENTS AND DANGER TO OTHER WILD ANIMALS. Z. Jagdwissensch. 3(4): 159-168. 1957.

In German with four-line English summary. Five commercial preparations of endrin (2 of which also contained aldrin) were tested on small numbers of domestic rabbits and pheasants. The poisons were offered on various foods for 6-day periods. Some trials were repeated with same individuals a month later. Individuals were observed for long periods after the feeding tests. Most of the animals developed strong aversion to the poisoned food and few ate enough to get a lethal dose. Avoidance of the food caused general weight losses. Most of the animals became sick and a few rabbits died. The 2 rabbits fed Rumentanil (20% endrin) died 4 weeks after test. This preparation was not tried on pheasants. Authors conclude that these endrin preparations are too dangerous to game animals to be used for control of field mice. If they must be so used, the area treated should be of no more than 1 hectare, so that game animals can avoid it successfully. Toxaphene is more repellent to game animals, and would have less effect on them if used for mouse control, than these endrin preparations.--C. M. Menzie.

Oliver, W. T., and H. S. Funnell. (Ontario Vet. Coll., Guelph.) THE QUANTITATIVE DETERMINATION OF MERCURY IN ANIMAL TISSUES. Am. J. Vet. Res. 19(73): 999-1000, 1 fig. Oct. 1958.

"A method is described for the recovery of mercury from and the quantitative determination of mercury in tissue. An average of 98 per cent recovery has been effected, within the range of 0 to 50 mg."--Auth. summ.

Peters, Harold. (Natl. Aud. Soc.) IS IT POSSIBLE THAT YOU ARE BEING STUNG? Fla. Wildl. 12(6): 4, 42. Nov. 1958.

An attack on the program for eradication of the imported fire ant. Supporters of the program claim the ant is a deadly enemy to crops, animals, and man. Actually the ant does not eat plants except rarely under starvation or drought conditions. There are no reports of it harming crops. It feeds mainly on insects. There is no good evidence that the ant causes significant loss of wildlife or livestock. There is just one highly questionable record of a child being killed by the ants. In contrast, native hymenoptera are said to have killed 82 persons in the U. S. in the last 5 years. Chemical warfare against the ant is causing great damage. Birds, mammals, other wildlife, and beneficial insects are killed wholesale. High kills of quail and rabbits have been noted and quail populations of some areas have been wiped out. Many domestic livestock and poultry have been killed. "In Decatur County, Georgia...about 100 cattle died as well as large numbers of chickens, turkeys, goats, sheep, and other farm animals. A reproductive failure in over 100 brood sows resulted..." The chemicals used are many times as toxic as DDT and are spread over the earth so that few animals can avoid them. They wash into water supplies. "The control agencies are to blame for selecting the hazardous method of broadcasting the poisons... They can stop this broadcast method, and they should do so at once!" Successful local treatments have been known for years.

Schöberl, A. (Chem. Inst., Tierärzlichen Hochschule, Hannover, Germany.) MODERN METHODS FOR DETERMINATION OF LEAD POISONING. Deutsche Tierärzliche Wochenschrift 65(9): 235-239, 6 figs. May 1958. [Reprint paged 1-14.]

In German with English summary. Tells how to determine minimal amounts of lead in animal tissues by 2 micromethods, "that is the photometric method by using dithizon, and the polarographic method... By these methods minimum amounts of lead may be established without a doubt and in relatively little material, especially in blood. In cattle we were able to establish a fluctuation of lead values in blood of about 0,03-0,17 mg%. Chronical lead intoxication in cattle, caused by a near lead mine, showed extremely high lead values in livers, i.e. 0,72 and 0,63 mg%. Similar intoxications have been observed in stags which lived in the neighbourhood of a lead mine, and which showed paralysis of the legs. Here we were able to find 0,6-0,7 mg% of lead in the livers, and even 4-8 mg% of lead in the bones."

Symposium. DISCUSSION OF AERIAL SPRAYING OF WOODLANDS WITH PESTICIDES. J. For. 56(12): 937-941. Dec. 1958.

W. V. Benedict of the U. S. Forest Service points out in his paper, The advantages of aerially spraying woodlands with pesticides, that light doses of DDT are effective in saving valuable timber, are safe for birds and mammals, and can be handled with relative safety for fish. However, insecticidal treatments should not be considered a cure-all--they are just one tool to be used in emergencies. R. L. Furniss of the U. S. Forest Service, Lowell Besley of the Pulp & Paper Res. Inst. of Canada, and George Hjort of the Boise Payette Lumber Co. agree with Benedict in stressing the great economic need for chemical treatment in emergencies. Besley grants serious reduction of salmon in New Brunswick, but feels that value of fish must be weighed against value of timber. S. A. Graham, forest entomologist at the University of Michigan, holds up the other side of the picture in his paper, Application of insecticides to forests: The negative side. Dr. Graham cites several examples of unwise and unnecessary forest spraying. In his discussion he emphasizes the point elaborated in Elton's recent book, that chemicals tend to simplify the biotic complex and therefore encourage population extremes. Biotic complexity, on the other hand, tends toward stability.

van Dresser, Cleveland. MAN VS. ANT. Am. For. 64(11): 14, 44-47, 6 photos. Nov. 1958.

After presenting a very dark [perhaps too dark] picture of the imported fire ant, the author tells how much damage to wildlife has been caused by various treatments for extermination of fire ant. Game authorities and sportsmen were all of the same opinion: "Don't indulge in mass spraying until more studies on the effect of such spraying have been made." The author believes the whole program began many years too late and is now too drastic. The control people should "make haste slowly." "There is too much at stake in the form of wildlife resources to risk their decimation while killing fire ants. The future of millions of game birds and animals rests on precisely what methods are going to be used to kill fire ants."

Whisenhunt, Matt. (Fla. Game Comm.) THE FIRE ANT ERADICATION PROGRAM AND WILDLIFE IN FLORIDA. Fla. Wildl. 12(6): 5. Nov. 1958.

The bill to make possible Florida's participation in fire ant eradication was passed over the governor's veto. It provides for control work without any contribution from landowners, and it provides for no research at all. The Fla. Game & Fresh Water Fish Comm., alarmed by reports from areas already treated, requested that treatment be limited to ground and hand equipment, and that no large, solid blocks be treated by any method. So far, work in Fla. has just begun. Reports, not yet verified by laboratory tests, have come in on losses of cats, dogs, bait-worm beds, song birds, chickens, fish, mammals, and amphibians. The author quotes work of Harrington and Bidlingmayer (see WR 91 p. 16) to show the devastating effects of dieldrin on aquatic life.

Yeager, Lee E., and Wayne W. Sandfort. (Colo. State U., Ft. Collins.) RAIN AND THE GAME. PART I. GAME BIRDS. Colo. Outdoors 7(6): 4-8, 4 photos. Nov.-Dec. 1958.

Colo. had ample rainfall in 1957, as it had a decade before. Both wet years followed drought. The moisture helped game birds in several ways. It increased the amount of winter cover, and it helped make it hard for farmers to burn much of this cover. It kept lots of corn from being cut for ensilage. By delaying mowing, rain gave pheasants a chance to hatch their broods and get them safely out of the alfalfa. Carryover of dead cover into next spring provided ideal nesting sites in uncultivated areas, where the big early broods could be brought off. Chukars benefited as well as pheasants, and produced a record crop in 1958. Ducks, of course, thrive in wet years, but they are affected less than pheasants. The reason is that in dry years ducks move to permanent waters, travel long distances to feed, and manage to produce better than might be thought. Large, shallow marshes are completely useless to ducks during drought, however, and about 1/3 of acreage of this sort has been taken over for human developments in the past decade.

WILDLIFE--PARASITES & DISEASES

Eickhoff, W. (Am Bethesda-Krankenhaus, Duisburg, Ger.) WILDLIFE SCIENCE AND HUMAN PATHOLOGY. Z. Jagdwissensch. 3(3): 114-119. 1957.

In German with English summary. One must be careful in applying the results of studies on one species to another species. Wildlife pathology is further complicated by our frequent lack of knowledge of the adequacy of the animal's food and cover. Wild rabbits when subjected to constant fright, eventually die with their thyroid gland resembling the human thyroid of Grave's disease. Wild boars and red deer do not exhibit this reaction. In wild boars, the thyroid weight remains constant at all seasons; but in red deer the thyroid weight varies according to sex, age and season. Hares and rabbits increase in weight Oct.-Jan. This may relate to maintenance of body temperature.--V. F. Flyger.

Gässlein, H. DIE CESTODEN DER VERTEBRATEN AUS DER UMGEBUNG ERLANGENS. Z. Paraskde. 16(5/6): 443-468. 1954. [From short German abstract by Mendheim in Z. Jagdwissensch. 3(4).]

Report on study in which 53 kinds of cestodes were collected from 973 birds of 124 species, and 25 kinds of cestodes were collected from 495 mammals of 41 species.

Genest, Paul. (Ecole Med. Vet. Quebec, St. Hyacinthe, Quebec.) LES MALADIES ANIMALES DU GROUPE DE LA PSITTACOSE. Can. J. Comp. Med. & Vet. Sci. 22(11): 386-391. Nov. 1958.

In French with English summary and 49 references.

WILDLIFE--POPULATIONS & FLUCTUATIONS

Beverton, Raymond J. H., and Sidney J. Holt. (Fisheries Labs., Lowestoft, Eng.) ON THE DYNAMICS OF EXPLOITED FISH POPULATIONS. Min. Agr., Fisheries & Food. Fishery Invest. Ser. II, Vol. XIX. 533 p., 155 figs., 70 tables. 1957. £6,6s. (over $18.00) from Her Majesty's Stationery Office, London.

A treatise formalizing the laws of fisheries dynamics in mathematical form. Here, as in physics, the differential equation is the language of the law; however, the authors supply analytical solutions for use in arriving at numerical results. Values given by mathematical models developed in the discussion are compared with empirical results of recent fisheries investigations and are found satisfactory. Principles and methods of fishery regulations are discussed in light of the theory developed. Although the theory presented was developed from fishery investigations, the concepts involved may have broad application in describing the dynamics of animal populations.--Zane Scheftel. [A long and favorable review of this important book was published in Ecology 39(4) p. 777 by K. E. F. Watt of the Statistical Lab., Sci. Serv., Can. Dept. Agr. Among the points brought out by Watt is the following: "Due to prior release of parts of this book in mimeographed form in 1954, there has been adequate opportunity to test the method of population estimation outlined on pages 233-7. Amongst the total array of mark-recapture and catch-per-unit-effort methods now developed, it seems the most ubiquitously applicable, the most foolproof and the cheapest to apply, for big game as well as fish."]

Matheson, C. (Natl. Mus. Wales, Cardiff.) PHEASANT AND HARE RECORDS FROM WELSH GAMEBOOKS. Natl. Lib. Wales J. 10: 205-214. 1957. [From J. Animal Ecol. 27(2).]

"Discusses the history of the pheasant in Wales, and the long-term variations in the brown hare population in Anglesey and Montgomeryshire."

Schwerdtfeger, F. MASSENVERMEHRUNG UND MASSENTOD / MECHANISMUS ODER ZUFALL? DICHTESCHWANKUNGEN UND GLEICHGEWICHTE BEI TIERISCHEN POPULATIONEN. Umschau 58 (13): 387-389. July 1, 1958. [From Bibliog. Agr. 22(10).]

WILDLIFE--BIOMETRICS

Adams, J. Stacy. INTERVIEWING PROCEDURES / A MANUAL FOR SURVEY INTERVIEWERS. U. of N. C. Press, Chapel Hill. viii + 56 p. 1958. $1.00.
"...the manual not only presents basic general principles and procedures of interviewing, but also gives the rationale behind them."--V. Schultz.

Darroch, J. N. (U. of Cape Town, S. Africa.) THE MULTIPLE-RECAPTURE CENSUS. I. ESTIMATION OF A CLOSED POPULATION. Biometrika 45(3/4): 343-359. Dec. 1958.
Discusses two models, A and B. "In (A) the sample sizes a_i are random variables while the p_i are parameters. ...(B), on the other hand, involves the a_i as parameters... In fact, if we had to generalize, we could say that (B) is likely to be appropriate when the main limiting factor on sample size is the trouble involved in marking animals and (A) when it is the difficulty in catching them."--V. Schultz.

Leslie, P. H., and J. C. Gower. (Bur. Animal Pop., Oxford U., Eng.) THE PROPERTIES OF A STOCHASTIC MODEL FOR TWO COMPETING SPECIES. Biometrika 45(3/4): 316-330. Dec. 1958.
Two varieties of a previously described model (WR 93 p. 18) have been programmed for the Elliot-N.R.D.C. 401 computer. The models are: Model I, where it is assumed that the birth-rate of each species remains constant, and Model II, where it is assumed that the death-rate of each species remains constant. The paper presents the procedure of programming and results of the study.--V. Schultz.

Mendenhall, W. (Inst. Stat., N. C. State College, Raleigh.) A BIBLIOGRAPHY ON LIFE TESTING AND RELATED TOPICS. Biometrika 45(3/4): 521-543. Dec. 1958.
"...bibliography covers papers concerned with statistical theory and methods applicable to the study of the life characteristics of some biological or physical body."--V. Schultz.

WILDLIFE--TECHNIQUES

Gregory, Tappan. NATURE PHOTOGRAPHY AT NIGHT. Denver Mus. Nat. Hist., Mus. Pictorial no. 14. 62 p., illus. 1957. Price not stated. [From short review by V. E. F. Solman, Can. Field-Nat. 72(4).]
"...deals historically with the fascinating record of Mr. Gregory who pursued the hobby of night photography of wildlife for more than fifty years and gained wider experience than any other photographer in that field. Mr. Gregory has traced the evolution of equipment from open charges of magnesium flash powder to magnetic synchronizers and flash bulbs." Includes 41 of the author's best night flash pictures of animals.

Loveless, C. M., W. T. Ware and F. J. Ligas. (Fla. Game Comm., Tallahassee.) A PORTABLE APPARATUS FOR PHOTOGRAPHING VEGETATIVE QUADRATS. J. Wildl. Mgt. 22 (4): 440-442, 1 fig. Oct. 1958.
A camera support apparatus for obtaining vertical photographs of vegetative quadrats is described and illustrated. Dimensions and materials required for construction are indicated. This apparatus is most applicable where low-growing vegetation is involved and where quadrat size does not appreciably exceed one square meter.--Authors.

Snyder, E. Bayne, and Harry Rossoll. CLIMBING SOUTHERN PINES SAFELY. S. For. & Range Exp. Sta. (New Orleans 13, La.), Occ. Pap. 159. 17 p., illus. 1958.
Experience of many men was pooled to produce this paper on safety precautions to be observed when working in trees with the aid of sectional ladders, ropes, etc. Several references on the subject are cited.

Worden, A. N., and W. Lane-Petter, editors. THE UFAW HANDBOOK ON THE CARE AND MANAGEMENT OF LABORATORY ANIMALS. xix + 951 p., illus. Courier Publ. Co., Tunbridge Wells, Kent, Eng. 2d ed. 1957. $10.00. [From reviews by L. H. Matthews, J. Animal Ecol. 27(2), and by D. W. Jenkins, A.I.B.S. Bul. 9(1).]

Based on work of nearly 90 contributors, this large book gives fullest instructions for care of a wide variety of animals. The first part deals with such general aspects as housing, feeding, and breeding. It incorporates a vast amount of research and presents the most up-to-date recommendations. The modern animal house must be as hygenic as a hospital. Nutrition must be studied even more carefully than in rearing farm animals. Chapters on breeding and maintenance of pure lines are packed with valuable information. "In the second part the various species are dealt with individually, and a chapter is devoted to each of the more important ones. Practically everything that is known about the care of laboratory stocks of rabbits, guinea pigs, mice, rats, dogs, cats and all other usual laboratory mammals are here collected and collated. In addition there are numerous chapters about mammals that are less familiar in experimental laboratories, at least in this country, and the management of some very interesting species is described. In addition to the mammals, large sections of the book are devoted to various birds, reptiles, amphibians and fishes. But that is not all--several species of invertebrates are dealt with at considerable length, and shorter notes are given about many other kinds of animals that may be required for special investigations."

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Baker, Rollin H. (Mich. State U., E. Lansing.) EL FUTURO DE LA FAUNA SILVESTRE EN EL NORTE DE MEXICO. Anales Inst. Biol. (Mexico) 28(1/2): 349-357. 1957 (June 1958).

In Spanish. A description is presented of n. Mexico--its human population, land-uses, and major wildlife species. Rapid encroachment of an expanding farming, ranching, and industrial economy, coupled with the average person's apathy toward sustained-yield management of renewable resources, is causing much concern. Suggested actions include: increased conservation education, investigations of status of big game herds, and establishment of parks and preserves, among them the Mexican part of the Big Bend Internatl. Peace Park. --Author.

Buckley, John L. (US F&WS, Wash. 25, D. C.) WILDLIFE IN ARCTIC AND SUBARCTIC ALASKA. p. 89-99, 4 figs., in Arctic Biology, 18th Biology Colloquium. 1957. Complete volume $2.50 postpaid from Biology Colloquium, 107 Commerce Hall, Ore. State Coll., Corvallis.

Discusses the human populations, native and white, of Alaska in early days and at present, and the differing ways in which these populations have affected the wildlife resource. The changing status of several important forms of wildlife is considered. The closing section takes up administrative problems in an area where many natives rely upon game for food, but have little concept of conservation, and where a white population that is heavy with transients generates extremely heavy hunting pressures on limited areas.

Clarke, C. H. D. (Ont. Dept. Lands & For., Toronto.) AUTUMN THOUGHTS OF A HUNTER. J. Wildl. Mgt. 22(4): 420-427. Oct. 1958.

Albert Schweitzer and other distinguished humanitarians have taught reverence for life and have condemned hunting. Clarke disagrees on both practical and philosophical grounds. Reverence for life has little meaning when divorced, as it often is, from concern with good care of the whole environment--the harmony of man and nature. Hunters are more likely to have this concern for the environment than are strict humanitarians. The desire for hunting has caused the enrichment and beautification of some environments. Herbivores must be controlled for their own good as well as for the good of man, and in most places man must be the source of this control. Death is natural and inevitable, and it is no more evil when inflicted by man than by starvation or disease. Hunting was basic in human evolution and culture and it is still highly important to both conservation and recreation. Cruelty is another subject. Cruelty is a perversion. Few hunters are thus perverted, and hunting itself is no crueler

than other causes of death. "Play, whether in ritual, law, religion, games, or any other of its manifestations can lose its roots and become degenerate. Hunting could lose its roots, too. Those who love it must clarify their own ideas as best they can, and become eternally vigilant, especially as the most artificial aspects of human culture spread like a cancer. Above all, we should esteem in ourselves and in our companions that maturity of spirit which alone places the right to hunt beyond question."

Dillon, Olan W., Jr. (US Soil Cons. Serv., Rosenburg, Texas.) WILDLIFE AND WATER CONSERVATION IN TEXAS. Texas J. Sci. 10(3): 352-357. Sept. 1958.

Tells how wildlife and fish are helped by watershed-protection structures, farm ponds, rice-field management, green-timber reservoirs, and irrigation reservoirs. Dillon also mentions various things that can be done specifically for wildlife under these situations.

Evans, Thomas R. (Ill. Dept. Cons.) WILDLIFE OF THE WATERSHED. Cons. Volunteer 21(126): 51-56. Nov.-Dec. 1958.

The Small Watershed Program under Public Law No. 566 will not benefit wildlife automatically--instead, damage may result. Through the law and its amendments, there are opportunities (1) for local groups to provide financial aid for wildlife developments within the program, and (2) for federal cost-sharing in projects beneficial to fish, wildlife, and recreation. Interested groups often do not realize that they may participate, and the public often is not fully informed of the long-term responsibilities and possibilities of the program. The viewpoint of overall resource management is not yet incorporated in the thinking of persons responsible for watershed projects.--L. F. Stickel.

Lampio, Teppo. HUNTING IN THE SOVIET UNION. Svensk Jakt, 1958, no. 10, p. 341-344. Oct. 1958.

In Swedish. In 1957 a Soviet delegation composed of Serg. Kryutschov, first deputy for the Chief of Centrosoyus, and Ivan Kiris, scientific chief of wildlife investigations, visited Finland, and a Finnish delegation, composed of Lampio and Chief Game Warden Eero Hiltunen, visited Russia over a whole year. Hunting in Russia is concentrated on fur-bearers. Game is public property. Theoretically a Russian can hunt anywhere, but large nature reserves, hunting cooperatives, and built-up areas are closed. There are 5 million hunters, mostly amateurs. There are over 2 million sport hunters, and about 2 million others, mostly settlers, who hunt a little. There are about 400,000 part-time commercial hunters and 35-40,000 professionals who combine hunting with fishing and reindeer culture. Of the 300,000 sport hunters in Moscow, 44,000 belong to the Moscow hunters' society. Trappers are organized in collectives. Yearly commercial production is 150 million pelts and 2 million birds, total value 1 billion rubles. Hunting is for meat, not for trophies. The moose is esteemed for its 1000 kg. of meat, the bear for its 300 kg. Muskrat is chief fur. Planting of 160,000 has given production of 43 million; planting of 12,000 sables has produced 650,000 skins. Intensive muskrat habitat management is carried out, especially at Centrosoyus' own collective, where yield was more than doubled in 2 years. There are 4 million ha. of game preserves, and 45 nature parks totaling 1,400,000 ha. In these an intensive effort is made to uproot predators and destructive animals. 136 persons work in the Inst. for Wildl. Res. in Moscow.--C. H. D. Clarke.

Riney, Thane. (Box 240, Bulawayo, S. Rhodesia.) OPPORTUNITIES FOR LAND VERTEBRATE RESEARCH IN NEW ZEALAND. A.I.B.S. Bul. 8(2): 21-23. Apr. 1958.

N. Z. biologists have the opportunity to make a significant contribution to several facets of the biology and ecology of basic and practical research on wild and feral vertebrates. The special opportunities arise from 3 causes: (1) introduction of a mammal fauna into a land originally without mammals, (2) the intrinsic nature of the indigenous fauna, and (3) the present early period in the growth of land vertebrate research. Studies especially suited to N. Z. are: (1) study of the process of extinction (a) of native birds, and (b) of unsuccessful liberations of introduced birds and mammals; (2) study of the process of colonization; (3) studies taking advantage of easily observed native birds; (4) ecological studies associated with large man-made plantations; and (5) under simplified ecological conditions, study of (a) the formation of animal problems, (b) several prey-predator relations, (c) populations of domestic animals that have gone feral, and (d) contributions to the newly developing field of human ecology.--Author.

WILDLIFE--HUNTING AREAS & PROBLEMS

Larson, Joseph S. (Wildl. Cons. Inc., 20 Spruce St., Boston 8, Mass.) SOME STRAIGHT ANSWERS ABOUT POSTED LAND. Mass. Wildl. 4(5): 2-5, 19, 4 photos. Sept.-Oct. 1958.

Popular account of author's M. S. study of the posting problem in Mass. For author's abstract of thesis, see WR 92 p. 22.

Noonan, Helen. (N. Y. Cons. Dept.) THE SHOOTING PRESERVE IN NEW YORK. N. Y. State Cons. 13(3): 4-5, map. Dec.-Jan. 1958-9.

Legislative history, numbers of shooting preserves now operating in N. Y., how much game was shot on them in 1957, regulatory requirements.

Sargent, F. O., C. C. Boykin, O. C. Wallmo, and E. H. Cooper. LAND FOR HUNTERS...A SURVEY OF HUNTING LEASES. Texas Game & Fish 16(9): 22-23, 29. Sept. 1958.

Preliminary study of the lease system in Texas. "...there are many instances in which farmers and ranchers have obtained a significant income through leasing their land for hunting. They have found that returns obtained from leasing hunting rights pay for range improvements and justify lower livestock numbers. The purpose of this report is to provide information concerning types of hunting leases, costs of leases to hunter, the amount of income derived from leases by owners, attitudes of farmers and ranchers concerning hunting leases, and recommended provisions of written hunting leases. A final section discusses research needed to improve our understanding of the economic importance of hunting leases with reference to wildlife management costs... The income derived from hunting leases varied widely. The income per lease varied from $45 to $3,750. The average income for these 48 leases was $750. The total income derived from leasing by 48 farmers and ranchers was $35,815... Many of the owners...did not originally intend to lease the land...but were persuaded to do so by the insistent demands of hunters... Since most of the lands of Texas are privately owned, research must be directed toward the determination of actual costs to farmers and ranchers of habitat improvement and preservation, and the costs of crop losses and reduced livestock production resulting... As income from wildlife resources increases, management for higher wildlife yields will follow. However, investments in habitat improvement and preservation will be too costly in some instances to be borne completely by the landowner. Where these situations occur it is reasonable to expect that the demand for use of wildlife resources may be satisfied by developing means of cost-sharing by the landowner and the public or by the landowner and private groups of individuals who benefit directly from enjoyment of this resource."

Titus, Harold. (Rt. 1, Traverse City, Mich.) FAREWELL TO FREE HUNTING? Field & Stream 63(8): 37-39, 104-105, 2 photos. Dec. 1958.

Basic changes are upon us. "There's no use wishing for the good old days, when a man could hunt where he pleased...smart sportsmen are finding new ways of cooperating for the good of all." Control of areas for hunting farm game and waterfowl is increasing rapidly. In Calif., 20,000 hunters are members of more than a dozen community hunting groups that control hunting on 300,000 acres. Hunters pay $7.50 to $10.00. Utah law provides for similar groups and allows charge of $0.50 per bird shot. The club type of organization is more usual in Ohio: Southeast Conservation Club of Columbus has 700 members and arrangements with farmers for use of 10,500 acres and a 40-acre lake; South Cuyahoga Sportsmen's Assn. has 400 members, 3500 acres. In Iowa, a private promotion has developed the Arrowhead Hunting Preserve, which posts, patrols, and does some management on 8000 acres of 37 farms. The 200 members pay $40 each. Two larger groups are the Hunters' Club of America in Kans. and Mo. and Frontiers, Inc. in Oreg. and Calif. Both insure farmers against damages and include the cost in the hunters' fees.--L. F. Stickel.

WILDLIFE--ECONOMIC & OTHER VALUES

Campbell, Howard. (N. M. Dept. Game.) THE ECONOMIC VALUE OF HUNTING AND FISHING IN NEW MEXICO. [Cover title: Hunting and fishing / New Mexico's multi-million dollar industry.] N. M. Dept. Game & Fish (Box 2060, Santa Fe), Bul. no. 7. v + 35 p., 6 graphs. 1958.

Detailed report, with 27 tables, of questionnaire survey. Data pertain to 1956. Hunting and fishing expenditures av. $231 for residents, $207 for non-residents. Total expenditures were about $32 million. More time and money was spent fishing than hunting. Deer and quail were by far the most popular game animals. Trout were more popular than warm-water fishes. Expenditures for hunting and fishing were greater than receipts for dairy products and sheep products combined. They were far greater than receipts for any plant crop other than cotton. Chief expenditures were for food and transportation, but lodging and equipment of many kinds were also important.

WILDLIFE--FOOD HABITS & TECHNIQUES

de Boom, H. P. A., and J. H. Dreyer. THE POSSIBILITY OF IDENTIFYING HAIR FROM S. A. GAME FOR FORENSIC PURPOSES. S. African J. Sci. 49(7): 233-234, 4 photos. Feb. 1953.

Hairs of S. African game animals are studied to facilitate identification of confiscated meat, to which some hairs usually adhere. The first step is washing and macroscopic inspection. Cuticular impressions are made by dropping hairs on warm gelatine-coated slides. Addition of 1% Nile blue sulfate to gelatine heightens contrast of the imprint. Cross sections are prepared by microtome after coating ether-washed hairs with celloidin, clamping them in a specially constructed frame, clearing in chloroform, and embedding in paraffin. Whole mounts are made in Euparal after clearing. Microscopic comparisons permit identifications of many samples, but allowance must be made for several types of variation, and some samples cannot be identified. [This reference was called to our attention by Alfred E. Smalley, U. Ky., Lexington.]

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Johnson, Morris. (N. Dak. Game Dept.) FARMERS, SPORTSMEN, AND BOUNTIES. N. Dak. Outdoors 21(6): 4-7, 18, 4 photos. Dec. 1958.

Big game license fees in N. Dak. are used completely in bounty payments; fees were raised in 1957 to cover an increasing bounty bill. Questionnaires returned by 2469 farmers and 503 hunters showed them to be 2:1 in favor of bounties. They did not agree as to which animals should be bountied, but fox, coyote, skunk, and crow ranked highest. Evidence against the bounty came in responses to other parts of the questionnaire: during the past 3 years (1956-58), nearly 90% of the farmers stated that there were more or as many foxes as in the previous year; at the same time, 80% of them stated that they had as many or more pheasants and Hungarian partridges as previously. Principal benefits of the bounty program go to trappers and a few aerial hunters, not to farmers and youths. The article contains a table and discussion of reasons given for and against the bounty, and points out the need for public education. -- L. F. Stickel.

Kebbe, Chester E. (Ore. Game Comm.) THE BOUNTY SYSTEM IN OREGON. Ore. State Game Comm. Bul. 13(11): 3-4, 7, 4 figs. Nov. 1958.

Ore. has 2 overlapping bounty systems supported by state funds and also has a government hunter system. How much good do the bounties do? Data show that most bobcats are taken incidental to hunting, not primarily because of bounty. Furthermore, bobcats are as numerous now as they have been for a long time. Bounties in general encourage fraud of various types, but they do not provide the stimulus for serious, full-time trapping. Usually they simply enable people to profit from animals they would have trapped or hunted anyway. Bounties do not discriminate between beneficial, rodent-eating individuals and stock-killing individuals. The cougar bounty is high ($60.00) and cougar hunting has become a popular trophy-seeking sport since World War II. At the same time, cougar range has shrunk and has been veined with roads. Take of cougars has dropped from an average of about 150 a year to 56 in 1957. Bounty on this species is no longer justified. Bounties have little value at best,

and their costs far outweigh their questionable merits. The Ore. Game Comm. favors repeal of bounties. Control should be in the hands of trained employees who would be assigned to problem areas and problem killers.

Smelser, Marguerite Angelo. UNCONTROLLABLE "CONTROL". Nat. Mag. 52(1): 33-40, 50, 9 photos. Jan. 1959.

A potent blast against predator and rodent control, especially poisoning with 1080. Much evidence from various sources is brought to bear against the control programs. The author believes that poisoning campaigns are needless and undesirable to begin with, and that predators are well known to be beneficial. Poisoning campaigns are eliminating our wildlife heritage, both directly and through secondary poisoning. Unwanted mortality of desirable animals is investigated only by agents of poisoning agencies and is then passed off or glossed over. Written complaints receive the same treatment. The poisoning agencies (U. S. Fish & Wildlife Service, state game and agricultural departments) generate pressure for control so as to maintain their vested interests, and they attempt to deceive or silence all critics. They claim that little 1080 is used, and that it is dispensed only by experts; actually, they turn over tons of 1080-treated grain to farmers for use without supervision, then disclaim responsibility for results. [To an impartial wildlife biologist, this article is clearly one-sided and emotional. The scientific appraisal demanded by the author, however, should be welcomed by all parties.]

Tester, John R. (Mus. Nat. Hist., U. Minn., Minneapolis.) DO BOUNTY PAYMENTS PRODUCE MORE GAME? Flicker 30(3): 88-90. Sept. 1958.

A short and simple explanation of why they do not. Citizens of Minn. should insist that the state's system of predator control be brought up to date by eliminating bounties, and that the money be spent where it will produce the most game.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Colorado. 1957-58 ANNUAL REPORT OF THE COLORADO GAME AND FISH DEPARTMENT. 33 p., illus. 1958.

A concise and relatively popular report.. It includes figures on kills of the various types of game; reports fur take, by species; and tabulates numbers of pumas bountied each year since 1945. It also provides brief descriptions of PR projects.

Maryland. FORTY-FIRST ANNUAL REPORT OF THE DIRECTOR AND TWENTIETH ANNUAL REPORT OF THE DEPARTMENT OF GAME AND INLAND FISH / 1958. Md. Cons. 35(6): 1-32, illus. Nov. 1958.

Report for year ending June 30, 1958. Tables report numbers of animals trapped and released, propagated game birds released, and deer killed. Notes are given on status and/or kills of various groups or species of game. Research projects are considered briefly. Work done in habitat development is summarized.

MARYLAND BOARD OF NATURAL RESOURCES / FOURTEENTH ANNUAL REPORT / 1957. xv + 188 p., 27 figs. [1958.]

A semipopular, descriptive report. Includes reports of the following departments: Tidewater Fisheries; Game & Inland Fish; Research & Education; Forests & Parks; Geology, Mines & Water Resources. There is also a section on new conservation legislation. Material on wildlife appears in reports of departments of Game & Inland Fish and Research & Education. These 2 reports tell of land acquisitions, habitat management work done, releases of game-farm animals, releases of live-trapped animals, and work in public relations. They also provide brief summaries of research projects, general statements of status of game species, and tabulation of deer kill. It is of interest that studies of bobwhite and dove wings were discontinued because adequate samples could not be obtained. "Statistical calculations show that 2,000 wings are necessary to determine a 10 percent difference in reproductive success. Because bobwhite is a relatively sedentary species it would be necessary to get at least 2,000 wings from a small area. Otherwise, differences for a large region will be only an average of perhaps widely fluctuating numbers."

Montana. BIENNIAL REPORT OF THE FISH AND GAME COMMISSION, MAY 1, 1956-APRIL 30, 1958. 1-50 p., illus. 1958.

Objectives and activities of the newly organized Game Management Section are discussed. Provision of state-owned winter range for elk continues to be successful in preventing crop damage and also permits planned herd management. Elk now are established on all suitable areas and planting has been discontinued. Limited hunting of mt. goat, Rocky Mt. bighorn, and grizzly bear is permitted. Deer harvest data (1951-57) show upward trend, but some stabilization in 1955-57. Merriam's turkey has been planted and is succeeding in some areas. Pheasant and Hungarian partridge are increasing. Waterfowl hunting statistics and species composition of harvest are given for 1956. A wildlife investigations laboratory has been established at the State College; principal work concerns food habits of big game. Only pheasants now are reared on game farms, as chukar rearing has been discontinued. Muskrat populations were reduced by drouth in ne. Mont. Beaver populations, determined by aerial survey, showed excessive densities in some areas. Table shows numbers and values of fur animals taken in 1955-57.--L. F. Stickel.

Oklahoma. BIENNIAL REPORT OF THE OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION FOR THE BIENNIUM JULY 1, 1956--JUNE 30, 1958. 51 p., illus. [1958.]

Fiscal data, list of research and management projects, and list of lands controlled by the department.

Pennsylvania. BIENNIAL REPORT OF THE PENNSYLVANIA GAME COMMISSION, 1956-1958. Pa. Game News 29(11): 33-96, illus. Nov. 1958.

Payment of 66 claims for bear damage cost only $2,434 in the biennium. A 10-year break-down of bear damage claims is given in table. Bounties paid on foxes and great horned owls cost nearly a quarter of a million dollars. Figures are given on numbers of animals bountied and numbers of various predators killed by commission personnel. Figures are also tabulated on numbers of raw furs sold, estimated game kill (by species or group), game farm production, and animals trapped and released. Brief descriptions are given of research projects; these took only 1-3/4 cents of the game fund dollar. Descriptions are also given of construction, maintenance, and land-management work done.

RESOURCES FOR THE FUTURE / ANNUAL REPORT FOR THE YEAR ENDING SEPTEMBER 30, 1958. Resources for the Future, 1145 19th St. NW., Wash. 6, D. C. viii + 107 p., photos, maps, & graphs. Dec. 1958.

Progress report of work on basic conservation problems done under grants or by staff. A broad study of land use in U. S. by Marion Clawson, Burnell Held, and Charles Stoddard reached first draft. "Land for Recreation" on p. 49-57 contains excerpts from this MS. "The Economics of Conservation Doctrine", p. 78-83, contains some preliminary results of Harold Barnett and Chandler Morse's study of historical and current conflicts between conservation and economic doctrines. "A laissez-faire economy operates on principles of maximum net revenue and minimum unit cost in production, and maximum satisfaction and free choice in consumption. But in conservation doctrine such a society is wasteful and aggravates natural resource scarcity." Other sections include: water resources, energy and minerals, regional socio-economic problems, resources education, and bibliography of publications.--L. F. Stickel.

West Virginia. [ANNUAL REPORT, CONSERVATION COMMISSION, FISCAL YEAR 1957-58.] W. Va. Cons. 22(10): 1-48, illus. Dec. 1958.

The section on Game Management, p. 13-21, includes good summaries of research projects on deer, gray squirrel, and bear. It also reports on studies and habitat development on management areas.

Worcester, Joann. (Govt. Res. Center, U. Kans.) GOVERNMENT AND NATURAL RESOURCES IN KANSAS: WILDLIFE AND RECREATION. Governmental Res. Center, U. Kans., Lawrence. 1-48 p., 5 maps. [1958.]

Description of organization and general functions of governmental units concerned with Kansas wildlife and recreation programs.

Bayer, David Edmon. SOME FACTORS AFFECTING THE GERMINATION OF SEEDS AND PLANT RESPONSES TO HERBICIDES OF THREE SPECIES OF SMARTWEED, POLYGONUM PENSYLVANICUM L., POLYGONUM PERSICARIA L., AND POLYGONUM LAPATHIFOLIUM L. Ph.D. thesis, U. Wis. 137 p. 1958. [From long abstract in Dissertation Abstracts 19(4).]

Provides much useful information on: 1. Conditions that promote after-ripening and germination of smartweed seeds. Includes data on scarification. 2. Control of smartweeds by a variety of herbicidal treatments. 3. Control of weeds in smartweed stands by use of herbicides that do little harm to smartweeds.

Bishop, James S., and Ruth Billard. (Conn. Bd. Game.) CONNECTICUT TIDAL MARSHES NEED PROTECTION. Conn. Wildl. Cons. Bul. 4(6): 1, 4-5, 1 photo. Nov.-Dec. 1958.

Conn. has only 20 sq. mi. of tidal marsh left--and more than 1.7 sq. mi. were lost in the last 2 years. This article tells how rich and valuable these marshes are and makes a strong plea for their preservation.

Foster, Charles H. W. (5 Vane St., Wellesley, Mass.) WETLAND VALUES: ARE THEY FACT OR FICTION? Mass. Aud. 43(2): 56-61, 3 figs. Nov.-Dec. 1958.

Well-balanced and well-informed discussion of Mass. wetlands in relation to agriculture, mosquito control, water supply, floods, wildlife, economic value, esthetic values, and city planning. An unusually good paper of its type.

Heath, R. G., and L. C. Ruch. (Mich. Dept. Cons.) AERIAL CONTROL OF CATTAIL WITH RADAPON. Down to Earth (Dow Chem. Co., Midland, Mich.) 13(3): 14-16, 2 photos. Winter 1957.

Conclusions: "1. Aerial treatment of cattail with 10 pounds of Radapon [85% sodium salt of dalapon] per acre, when growing in less than eight inches of water, gave approximately 90% control one year following treatment. 2. Control from 10 pounds of Radapon per acre was approximately the same as from the 20-pound applications. 3. Four gallons of aqueous solution per acre gave suitable coverage, and was as effective as the higher rates. 4. Ten or 20 pounds of Radapon per acre eliminated cattail seed production the year of treatment and the year following. 5. A single application of 10 or 20 pounds of Radapon per acre to cattail standing in eight or more inches of water permitted approximately 35 per cent regrowth. 6. One year after treatment, surviving cattail stems averaged about half the height of the untreated stems. Many showed chemical damage in the form of twisted, abnormal growth." "Our data suggest that there was no significant damage by dalapon to any of the valuable waterfowl food plants present."

Jansen, L. L., W. A. Gentner, and J. L. Hilton. (US Dept. Agr., Beltsville, Md.) A NEW METHOD FOR EVALUATING POTENTIAL ALGICIDES AND DETERMINATION OF THE ALGICIDAL PROPERTIES OF SEVERAL SUBSTITUTED-UREA AND S-TRIAZINE COMPOUNDS. Weeds 6(4): 390-397, 2 photos. Oct. 1958.

Summary: "A new method for screening algicidal chemicals, using nutrient-moistened perlite as a substrate and employing greenhouse culture conditions, is described. The method is well adapted for inclusion in a number of existing screening programs. Preliminary evaluation of 14 chemicals has demonstrated considerable algicidal potential for four substituted-urea herbicides and seven s-triazine derivatives. All of these compare very favorably in performance with copper sulfate. Dichlone and CIPC were not as effective as the copper sulfate standards."

Springer, Paul F. (Patuxent Refuge, Laurel, Md.) MOSQUITO CONTROL AND WILDLIFE MANAGEMENT. Proc. 4th Ann. Conf. Ill. Mosquito Control Assn. p. 55-62, mimeo. Feb. 1958.

Mosquito control operations can be planned to minimize damage to wildlife and even to improve conditions for wildlife. Environmental control methods that will improve or maintain wildlife habitat include: (1) sump drainage, in which a closed ditching system leads to permanent ponds; (2) water impoundment, in which water is kept deep enough to prevent breeding by the more pestiferous mosquito species; (3) introduction of mosquito-eating fish; (4) shoreline conditioning, in which steeper shorelines are developed to reduce the shallow water zone that is favorable for mosquitoes; (5) dewatering, in which seasonal

drainage prevents mosquito breeding and also promotes growth of waterfowl food plants; (6) introduction of biological control agents such as blue-green algae, parasitic protozoons, fungi, bacteria, and helminths. Another section of the paper tells what insecticidal dosages are safest for fish and wildlife and which are most dangerous.

Timmons, F. L., L. W. Weldon, and W. O. Lee. (US Dept. Agr., Laramie, Wyo.) A STUDY OF FACTORS WHICH INFLUENCE EFFECTIVENESS OF AMITROL AND DALAPON ON COMMON CATTAIL. Weeds 6(4): 406-412, 4 photos. Oct. 1958.

Summary: "Early-season applications of amitrol and dalapon were less effective on cattail than late-season applications at a more mature stage of growth. Twenty pounds per acre in split applications was much more effective than 10 lb/A and just as effective as 40 lb/A. Forty gallons per acre was as effective as higher volumes of spray with amitrol, but the relation of volume of spray to effectiveness of dalapon was not clear. The addition of diesel oil and emulsifier greatly increased the effectiveness of dalapon but did not increase the effectiveness of amitrol..."

FARMLAND & WILDLIFE

Ferber, Arthur E. (US Soil Cons. Serv.) WINDBREAKS IN CONSERVATION FARMING. US Dept. Agr. (Soil Cons. Serv.) Misc. Publ. no. 759. 22 p., illus. 1958. 20¢ from Supt. Documents.

Helpful, well-illustrated booklet that demonstrates the values of windbreaks and tells how to establish and maintain them. The paper is usefully detailed and takes account of local situations.

Henson, P. R., and C. H. Hanson. ANNUAL LESPEDEZAS / CULTURE AND USE. US Dept. Agr., Farmers' Bul. no. 2113. 1-16 p., 6 figs. Apr. 1958. 10¢ from Supt. Documents.

Useful bulletin that takes up the 5 varieties and their areas of adaptation, soil and fertilizer requirements, seeding, uses for hay and pasture, harvesting of seed, use in soil improvement and erosion control, cropping systems, insect pests, weeds, and diseases.

Longley, Wm. H. (Minn. Div. Game.) BIRD LIFE AND VEGETATION CHANGES--WHITEWATER REFUGE. Flicker 30(3): 84-87. Sept. 1958.

Summary: "Ecological succession studies were made on a 103-acre tract of recently abandoned farmland in the Whitewater State Game Refuge in southeastern Minnesota. Succession of vegetation on an upland field was charted for five years, showing the decline of annual plants and the rise to dominance of quack grass and goldenrod. Breeding bird populations increased from 87 pairs of 39 species to 128 pairs of 51 species. Decreases in squirrel numbers and increases in Cottontails may have been related to the changes in vegetation."

RANGELAND & WILDLIFE

Beetle, Alan A. (U. Wyo., Laramie.) GRASSLAND CLIMAX, EVOLUTION, AND WYOMING. U. Wyo. Publ. 21(2): 64-70. 1957. [From Biol. Abst. 32(10).]

"This paper is a refutation of a paper by C. O. Sauer which considered fire to be the driving force in the spread of grasslands... 'Our true grassland dominants date back at least to Miocene time and have changed but little since. Temperate grasslands the world over should be recognized as equally stable, historically, with tropical forests, deserts, and temperate forests.'"

Dyksterhuis, E. J. (US Soil Cons. Serv., Lincoln, Neb.) ECOLOGICAL PRINCIPLES IN RANGE EVALUATION. Bot. Rev. 24(4): 253-272. Apr. 1958. [From Biol. Abst. 32(12).]

See long author's summary in Biol. Abst. 32(12).

Goebel, Carl J., Leonard Debano, and Russell D. Lloyd. (Utah State U., Logan.) A NEW METHOD OF DETERMINING FORAGE COVER AND PRODUCTION ON DESERT SHRUB VEGETATION. J. Range Mgt. 11(5): 244-246, 4 figs. Sept. 1958.

Hubbard, Richard L. GERMINATION OF THIOUREA-TREATED BITTERBRUSH SEED IN THE FIELD. US For. Serv., Calif. For. & Range Exp. Sta. (Berkeley), For. Res. Notes no. 138. 6 p. Apr. 1958.
"Thiourea treatment is an effective method of breaking the dormancy of bitterbrush seed to permit spring planting." Methods and field results are described.

Hubbard, Richard L. HOT WATER BATH AND THIOUREA BREAK DORMANCY OF WEDGELEAF CEANOTHUS SEED. US For. Serv., Calif. For. & Range Exp. Sta., For. Res. Notes no. 143. 4 p., 1 fig. Aug. 1958.
The technique provides 31% germination of seeds of Ceanothus cuneatus, a species well suited to aerial seeding of burned or run-down deer ranges.

Humphrey, Robert R. (Ariz. Agr. Exp. Sta., Tuscon.) THE DESERT GRASSLAND: A HISTORY OF VEGETATIONAL CHANGE AND AN ANALYSIS OF CAUSES. Bot. Rev. 24(4): 193-252. April 1958.
This grassland occurs in se. Ariz., s.-cent. and sw. N. M., sw. Texas, and far into Mexico. Most of the grass species are in the genera Bouteloua, Hilaria, and Aristida. Main subjects discussed are grazing history, early vegetation, successional status, and factors underlying vegetational changes (grazing by livestock, change of climate, plant competition, rodents and rabbits, fire). Restriction of fire and spread of grazing and rodents have caused the spread of woody vegetation, principally mesquite. There is a bibliography of about 140 items.--Neil Hotchkiss.

Humphrey, R. R., and L. A. Mehrhoff. (Ariz. Agr. Exp. Sta.) VEGETATION CHANGES ON A SOUTHERN ARIZONA GRASSLAND RANGE. Ecology 39(4): 720-726, 2 maps. Oct. 1958.
Undesirable woody plants have increased markedly on the Santa Rita Exp. Range since 1904. This study was designed to find out why. Conclusions are that: "(a) there have been no apparent changes in climate that would result in the vegetational changes noted; (b) grazing by domestic livestock has affected the composition of the vegetation, in part because of seed dissemination, in part because of selective grazing and in part because of the removal of grass by grazing that formerly served as fuel for range fires; (c) rodents bury mesquite seeds and transport cholla cactus joints, thus serving to propagate these plants; (d) fires maintained the desert grassland as such, prior to the introduction of livestock; (e) shrub invasion of southern Arizona semidesert grassland ranges is due primarily to reduction of range fires." Supporting evidence from other studies is quoted.

Schultz, A. M., H. H. Biswell, and J. Vlamis. (U. Calif., Berkeley.) RESPONSES OF BRUSH SEEDLINGS TO FERTILIZERS. Calif. Fish & Game 44(4): 335-348, 11 photos. Oct. 1958.
Seedlings of several Calif. species of brush were tested in pots for their response to N, K, and P. Results are tabulated and discussed in connection with the effects of burns on available nutrients. Possibilities of selective management of game ranges are also discussed.

Weaver, J. E. (U. Neb., Lincoln.) NATIVE GRASSLAND OF SOUTHWESTERN IOWA. Ecology 39(4): 733-750, 12 figs. Oct. 1958.
"The vegetation on a 200-acre tract of native grassland in southwestern Iowa and the environment in which it grew have been described. The study began in 1928, continued throughout the great drought of 1933-40, and intermittently since that time. It describes typical, annually mowed prairie under a precipitation in excess of 30 in. on the border line between the more mesic prairies eastward and the southward and the more xeric ones westward. This grassland was scarcely affected by the drought. It was the last large area of natural vegetation found in southwestern Iowa, and has now been plowed or pastured... The ancient origin, complex composition, and resistance of this grassland to invasion have been discussed. The interrelations of grasses and forbs, their role in the formation and maintenance of a rich, deep, productive soil have been emphasized. Prairie vegetation and prairie soils are closely related, intimately mixed, and highly interdependent upon each other and upon the climate. But the once 'magnificent, endless prairie' is now near extinction."

Whitford, Philip B. (U. Wis., Milwaukee.) A STUDY OF PRAIRIE REMNANTS IN SOUTHEASTERN WISCONSIN. Ecology 39(4): 727-733. Oct. 1958.
Analysis of 27 stands suggested that they were able to persist in a forest region and to resist invasion by weeds and woody plants because of their heavy, moist soils.

FORESTLAND--FORESTRY & ECOLOGY

Crandall, Dorothy L. (Randolph-Macon Woman's Coll., Lynchburg, Va.) GROUND VEGETATION PATTERNS OF THE SPRUCE-FIR AREA OF THE GREAT SMOKY MOUNTAINS NATIONAL PARK. Ecol. Monog. 28(4): 337-360, 16 figs. Oct. 1958.
For brief abstract of thesis, see WR 92 p. 6.

Dana, Samuel Trask. RESEARCH IN FOREST RECREATION. US For. Serv., Wash., D. C. 36 p. Apr. 1957. [From review by F. M. Packard, Natl. Parks Mag. 32 (135).]
"Confronted with the necessity of providing outdoor experience for millions of Americans, the Forest Service commissioned Dean Dana to analyze its problem and arrive at recommendations to guide its attack... The author discusses methods of making such studies and how to integrate recreation into the multiple-use concept. He recommends an educational program comparable to that provided in the national parks. Dean Dana has presented a strong case for elevating recreational use of the national forests to a level equivalent to that now held by timber production, grazing and other commodity uses. His report should lead to re-evaluation of all the functions of these lands." Optimum use of a given area may require favoring a single use. Recreation should be given the benefit of the doubt as to what is the best use over the long term.

Hughes, Ralph H. (SE. For. Exp. Sta., Asheville, N. C.) RESPONSE OF CANE TO BURNING IN THE NORTH CAROLINA COASTAL PLAIN. N. C. Agr. Exp. Sta. (Raleigh), Bul. 402. 1-24 p., 11 figs. Sept. 1957.
Stands of cane, Arundinaria tecta, are of great value for grazing, but deteriorate in about 10 years. This paper reports on quantitative effects of experimental burning and experimental protection from burning and grazing on different sites. Grazing management alone cannot restore stands. Controlled burning restores vigor and should be used about once a decade. Maximum forage production occurs 2-4 years after burning and apparently is maintained for 6-8 more years. Burning increases susceptibility to grazing, so grazing should be regulated carefully during summer, especially in first year after burning.

Kilburn, Paul Dayton. HISTORICAL DEVELOPMENT AND STRUCTURE OF THE ASPEN, JACK PINE AND OAK VEGETATION TYPES ON SANDY SOILS IN NORTHERN LOWER MICHIGAN. Ph.D. thesis, U. Mich. 280 p. 1958. [From informative abstract in Dissertation Abstracts 19(3).]

Laessle, Albert M. (U. Fla., Gainesville.) THE ORIGIN AND SUCCESSIONAL RELATIONSHIP OF SANDHILL VEGETATION AND SAND-PINE SCRUB. Ecol. Monog. 28(4): 361-387, 15 figs. Oct. 1958.
Study of certain important habitats in Fla. Some of the coastal sediments were severely washed and sorted by water and wind, leaving little but siliceous sands. All deposits of these sands are occupied by scrub vegetation where drainage is good, or by hammock where fire has been excluded or minimized. Most other well-drained deposits, less severely washed and sorted, are occupied by sandhill vegetation (longleaf-pine/turkey-oak association). There is no successional relationship between scrub and sandhill vegetation. Scrub and sandhill vegetation represent the 2 most prevalent well-drained sub- or fire-climax communities in peninsular Fla. Each, in the absence of fire, would eventually, often very rapidly, be succeeded by predominately evergreen hardwood tree communities known as hammocks.--From auth. summ.

Mark, Alan Francis. AN ECOLOGICAL STUDY OF THE GRASS BALDS OF THE SOUTHERN APPALACHIAN MOUNTAINS. Ph.D. thesis, Duke U. 376 p. 1958. [From informative abstract in Dissertation Abstracts 19(3).]

Gives much evidence as to how the balds were established and how they are maintained. In brief, the areas lost their spruce-fir cover in a xerothermic post-glacial period, and spruce-fir has not been able to reestablish itself as yet owing to lack of seed source. Spruce-fir forest is invading some balds. Balds are surrounded by hardwood forest, but this forest is ill-adapted to the extreme conditions on balds. Grazing and other factors tend to maintain or extend balds.

Mark, A. F. (Otago Catchment Bd., P. O. Box 858, Dunedin, N. Z.) THE ECOLOGY OF THE SOUTHERN APPALACHIAN GRASS BALDS. Ecol. Monog. 28(4): 293-336, 12 figs. Oct. 1958.

See preceding entry.

McCormick, Jack. THE LIVING FOREST. Harper & Bros., 49 E. 33d St., N. Y. 16, N. Y. viii + 127 p., with photos or drawings on 65 p. 1959. $3.95.

Handsomely illustrated popular story of the forest as an ecological community and of the significance of forest to man. The book should be a fine introduction for laymen and interesting collateral reading for secondary school students. It was written in conjunction with the opening of the Hall of N. Am. Forests at Am. Mus. Nat. Hist. and is based on materials gathered in connection with this exhibit. Topics concerning the forest include: the community, life of the forest floor, insects and diseases, weather, stories a stump can tell, forest types in N. Am., natural changes, harvest by man.--L. F. Stickel.

Neiland, Bonita J. (U. Ore. Mus. Nat. Hist., Eugene.) FOREST AND ADJACENT BURN IN THE TILLAMOOK BURN AREA OF NORTHWESTERN OREGON. Ecology 39(4): 660-671, 8 figs. Oct. 1958.

Good ecological comparison of burned and unburned areas. Physical factors and plant ecology are considered, not animal ecology.

Symposium. MANAGEMENT OF BOTTOMLAND FORESTS. PROCEEDINGS SEVENTH ANNUAL FORESTRY SYMPOSIUM, APRIL 10-11, 1958. Sponsored by Sch. For., through General Ext. Div., La. State U., Baton Rouge. iii + 114 p., figs. 1958.

A mimeographed, paper-covered volume that contains 17 papers on management and utilization of southern hardwoods. None of the papers pertains directly to wildlife.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Clarke, C. D. (Ont. Dept. Lands & For., Toronto.) WILDLIFE IN THE FOREST. For. Chron. 34(1): 7-12. Mar. 1958.

The word "forest" originally meant a hunting area; present meaning developed later, as did single-minded exploitation. In Algonquin Park, there is no forest regeneration, and this is because of the deer. The herd is healthy and has not damaged the forest to the deer's detriment--only to the detriment of tree production. No hunting is allowed in the park. What should the policy be? "The plain truth is that nothing evokes a quicker or more popular response than the idea of a sanctuary, and in no small degree it is at the bottom of the National Park program which, on this continent, may soon claim a hundred million visitors a year. In the face of such an industry, on an economic basis alone, there are obviously places where trees are worth more standing in their places and rotting where they fall than in any other use..." Is Algonquin Park such a place? "I may be wrong, but I believe that if it had ever been put to a vote there would have been no logging in Algonquin Park. Now we want to hunt deer! What will there be left on the Park? ...For all future problems of the same order it will be much easier to deal with the public if forestry interests take the lead in showing a genuine appreciation of other uses of the forest than growing and cutting trees."--L. F. Stickel.

Cringan, A. T. (Ont. Agr. Coll., Guelph.) INFLUENCE OF FOREST FIRES AND FIRE PROTECTION ON WILDLIFE. For. Chron. 34(1): 25-30. Mar. 1958.

"Forest fire protection, in the absence of succession-initiating factors like logging and forest insect outbreaks other than fire, may cause the moose-carrying capacity to decline rapidly and the woodland caribou-carrying capacity to increase slowly. The combined carrying capacity for all species of big game undoubtedly decreases." These facts are amplified by examples and calculations for the Sioux Lookout Forest Protection District, Ont. The factors of forest harvest and disease should be considered also in estimating future game populations.--L. F. Stickel.

de Vos, Antoon. (Ont. Agr. Coll., Guelph.) THE INFLUENCE OF BROWSING ANIMALS ON FOREST REGENERATION. For. Chron. 34(1): 21-24. Mar. 1958.

A review of careful studies made in different areas shows a very wide range of effects of browsing--from beneficial to harmful, and often quite independent of actual browsing pressure. Apparent deer damage is not always deleterious to a stand. Reliable conclusions can be drawn only from careful local studies.--L. F. Stickel.

MacNamara, L. G. (N. J. Div. Game.) UPLAND UPLIFT / THE DEVELOPMENT OF AREAS OF LOW QUALITY SOILS FOR WILDLIFE AND PUBLIC USE IN SOUTHERN NEW JERSEY. N. J. Outdoors 9(5): 2-7, 8 photos. Nov. 1958.

The N. J. coastal plain has large areas of poor soil covered with relatively poor stands of pine and oak intermixed with poorly drained spots. Owing to land prices, this is the sort of land the state gets for wildlife management. Fire was tried as a tool, but did not produce good results. Clearing and cultivating of small areas (1/8-acre or less) was unsatisfactory owing to shading and rapid reversion. The present program involves clearing one 5-acre field in each 100 acres. Clearing is done with tractor bearing rake-type blade on front; this leaves the duff and humus. Fields are limed, fertilized, and planted to rye the first year. Second year, liming and fertilizing are repeated if needed and soybeans are planted. Third year, fields are planted to mixtures of "Lespedeza sericea and false blue indigo, Lespedeza and burnet, or Lespedeza sericea and red top grass. Field edges are planted with Lespedeza sericea and Lespedeza intermedia, Lespedeza bicolor, or mixed Lespedezas. During the first year of growth the perennials do not offer a food source. For this reason a 1/4-acre of food patch mixture is planted..." After this the fields need no attention for 5 years, when sprout growth has appeared and new cultivation and fertilization are needed to keep herbaceous growth heavy. The program has had excellent results with several types of farm and forest game.

Mikola, Peitsa. DEVELOPMENT OF FINLAND'S FORESTS AS THE ENVIRONMENT OF GAME. Suomen Riista 12: 125-136, 6 photos. 1958.

In Finnish with English summary on separate mimeo. sheet. Finland's climate has warmed in the past 100 years, and the n. timber line has advanced, to the benefit of game. Original clearing and burning promoted growth of deciduous trees and favored game. Recent forestry practices tend to reduce deciduous trees in medium-aged and old forests, but to increase deciduous growth--and hence game--in seedling-stand areas that are subjected to broadcast burning.

Pase, Charles P. (Rocky Mtn. For. & Range Exp. Sta., Ft. Collins, Colo.) HERBAGE PRODUCTION AND COMPOSITION UNDER IMMATURE PONDEROSA PINE STANDS IN THE BLACK HILLS. J. Range Mgt. 11(5): 238-243, 4 figs. Sept. 1958.

Good quantitative report on forage production under different degrees of thinning. Thinning caused great increases of grass, forb, and shrub production. "Thinning immature pine stands on critical deer winter range to and beyond accepted silvicultural standards appears to be one way of increasing the forage supply."

Passmore, R. C. (Ont. Dept. Lands & For., Tweed.) FORESTRY AND WILDLIFE MANAGEMENT: SOME DIFFERENCES AND SIMILARITIES IN INVENTORY AND HARVEST. For. Chron. 34(1): 13-20. Mar. 1958.

Wildlife management and forestry management have a basic similarity in their need for inventory and for planning for sustained yield. Wildlife inventory is more complex and less well developed; harvest is less controllable; the turnover period is shorter. Actual counts or even trend data are not always necessary to determine adequacy of harvest, for this often can be judged by condition of range and productivity and condition of the animals.--L. F. Stickel.

Robinson, D. J. (Dept. Recreation & Cons., Nanaimo, B. C.) FORESTRY AND WILDLIFE RELATIONSHIP ON VANCOUVER ISLAND. For. Chron. 34(1): 31-36. Mar. 1958.

Under the original forest cover, there was little game in w. and n.-cent. Vancouver, where balsam, spruce, hemlock, and fir grew. There was some game in drier e. and s. coastal Douglas-fir areas. Traditional clear-cut logging of large areas produced game eruptions that lasted for a decade or two, then dwindled. Soil, water, and fish were adversely affected. Deer raised on new slashes have well-developed antlers and weigh 100-140 lb. in the round when just over a year old. The first sign of change is in deterioration of animal quality; a rapid decline begins in 3 yrs. The population rise continues after weight and growth decline begin, but later numbers drop too, so there are few animals and these are small. Cycle for blue grouse is similar but shorter. More recent forestry practice is patch logging of 200-300 acres or less on a 60-70 yr. rotation. Under this system the over-all game populations are stabilized and management becomes practical. Water and soil potentials are maintained; damage to tree plantings is reduced; extensive, uniform single-species stands, which are especially susceptible to disease and fire damage, are eliminated. Public use of forest lands brings 2 benefits to forest industry: relief from uncontrolled wildlife populations and improved public relations.--L. F. Stickel.

Seiskari, Pertti. THE EFFECT OF THE DEVELOPMENT OF FINLAND'S FORESTS ON THE ENVIRONMENT OF GAME ANIMALS. Suomen Riista 12: 21-42, 15 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. Natural forest succession in Finland is reducing the proportion of deciduous trees, which began to grow after the early days of deforestation by burning. Modern forestry methods also promote coniferous tree stands. These trends will have a continually greater unfavorable effect on black grouse, hazel grouse, hare, and moose.

Seiskari, Pertti, and Heikki Suomus. FELLING ASPEN AND THE MANAGEMENT OF ASPEN STANDS FOR WINTER FOOD FOR GAME. Suomen Riista 12: 69. 1958.

In Finnish with English summary on separate mimeo. sheet. Experiments showed that varying hare and moose collect to feed where aspen are felled and that moose can be kept away from pine seedling stands by making aspen available. For continuous winter feeding, the felling must be planned so that an av. of only 1/40 of the aspen of an area is taken; practices must be followed to increase young age classes.

Siivonen, Lauri. (Unioninkatu 45B, Helsinki.) THE MOST IMPORTANT GAME MANAGEMENT MEASURES OF THE NEXT FEW DECADES. Suomen Riista 12: 12-20, 2 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. Winters in Finland have become colder, longer, and more snowy for 2 decades, and this trend is expected to continue. There also has been a marked decrease in deciduous trees, especially birch, alder, and aspen. Partridge, pheasant, and Eur. hare will be in increasing difficulties, but the changes will favor varying hare, stoat, ptarmigan, bean goose, golden eye, moose, squirrel, and fox. Management recommendations are made for the most important species.

Smith, Robert Leo. (W. Va. U., Morgantown.) CONIFER PLANTATIONS AS WILDLIFE HABITAT. N. Y. Fish & Game J. 5(2): 101-132, 12 figs. July 1958.

62 plantations in s.-cent. N. Y. were studied to ascertain effects of reforestation on wildlife and to suggest management practices to improve plantations for wildlife. The plantations included 10 coniferous species in pure and mixed plantings, were of various age and height classes, and had various acreages and edge conditions. A wildlife succession was associated with increasing height. Seasonal preferences by various wildlife species for certain conifers, and the growth behavior of various trees, influenced wildlife use of plantations, especially those more than 12 feet high. Distribution and abundance of wildlife was influenced by area, nature of edge, size and abundance of openings, and management practices applied. Plantations of more than 10 acres held a greater variety and a larger population than small plantations, for they offered forest-like conditions and a variety of habitat situations. Diameter of plantations was of little importance as long as openings occurred. Wildlife use of smaller plantings was influenced by adjacent cover. Locust strips in plantations stimulated a dense growth of bramble and grass that furnished both cover and food high in nitrogen. The cover value of plantations was reduced by pruning and thinning. Plantations pass through a period of low productivity to a maximum and decline to a minimum again. The problem is to maintain a plantation in its most useful condition. Suggested management practices include: creation of a variety of food-producing openings in large plantations; establishment of black locust strips; development and sodding of fire lanes; construction of ponds and marshes; planting several types of conifers, such as pine and spruce, in strips or blocks; surrounding pine plantings with widely spaced spruce to improve edge cover and reduce wind penetration; spacing trees 10 by 10 feet to maintain suitability of planting for small game over a longer period; developing stands of uneven height; restricting pruning to crop trees, with outside rows remaining undisturbed; leaving unplanted strips along hedge rows; and encouraging hardwood growth on poorer sites.--Author.

Westell, Casey E., Jr. (Am. Box Board Co., Filer City, Mich.) AN INTEGRATED PROGRAM OF FOREST AND WILDLIFE MANAGEMENT. For. Chron. 34(1): 37-38. Mar. 1958.

A program for aspen management that also will benefit deer was developed through a U. of Mich. research project, adopted and promoted by the forest industry, and accepted and supported by public and private conservation agencies. [For details, see earlier papers by Westell: WR 76 p. 53, 83 p. 86, 84 p. 29, 88 p. 58.]--L. F. Stickel.

STRIPPED LAND & MISCELLANEOUS HABITATS

Finn, Raymond F. TEN YEARS OF STRIP-MINE FORESTATION RESEARCH IN OHIO. US For. Serv., Central States For. Exp. Sta. (Columbus 15, Ohio), Tech. Pap. 153. 11 + 38 p., 15 figs. June 1958.

Comprehensive report with tables and informative text. Takes up: description of sites studied, suitability of tree species for various types of sites, mixed plantings, direct seeding, effect of grading, use of fertilizers and soil conditioners, planting methods, effects of aspect and slope, effect of acidity on growth, hazards to plantations, and research needs. Initial problems have been solved and some stands are already providing posts and Christmas trees. Emphasis is now shifting from rehabilitation to management problems.

Richardson, J. A. (King's Coll., Newcastle upon Tyne, Eng.) THE EFFECT OF TEMPERATURE ON THE GROWTH OF PLANTS ON PIT HEAPS. J. Ecol. 46(3): 537-546, 7 figs., 1 pl. Nov. 1958.

Because of the composition and the slope of pit heaps, high temperatures may persist in the surface layer for several hours daily in summer. Temperature records are given that show the ameliorating effect of the presence of colonizing species such as Agrostis tenuis and Holcus mollis. The rate at which pioneer species become established on pit heaps appears to be accelerated by the presence of a moss-lichen layer.--Auth. summ.

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Hankla, Donald. (N. C. Wildl. Resources Comm.) UTILITY RIGHTS OF WAY--WILDLIFE LANDS OF PROMISE. Wildl. in N. C. 23(1): 18-19, 7 photos. Jan. 1959.

Experimental plantings of a right-of-way in Duke For. near Durham, N. C. began in 1951. They consisted of shrub lespedeza along woods euge and either fescue and ladino clover or sericea lespedeza below power lines. In the 7 years, sericea provided excellent cover and some food for rabbit and quail--and it did an excellent job of preventing tree invasion. Fescue-ladino plots provided superior wildlife habitat, for they became invaded by legumes, weeds, and brambles. But they resisted tree invasion. Borders of shrub lespedeza rated high in food production, despite having no maintenance after planting. Untreated plots grew up in trees and were relatively poor wildlife habitat. "The study indicated that if utility company rights of way were seeded to low growing perennials after they are cleared, long-term maintenance problems and costs would be considerably reduced and sportsmen would be greatly benefited by the creation of prime game-producing habitat." [Nearly complete.]

Klingman, D. L., and others. SUGGESTED GUIDE FOR CHEMICAL CONTROL OF WEEDS. US Dept. Agr., Agr. Res. Serv., ARS 22-46. iii + 55 p. May 1958.

Good publication that provides much information in concise form. Pages 2-12 discuss the chemicals: uses, toxicities, other characteristics. Pages 13-16 treat calibration of sprayers, effect of weather, etc. Most of the rest of the booklet consists of recommendations (and precautions) for control of weeds in given crops or situations. One section takes up control of floating, submersed, and emergent aquatic weeds.

Sluder, Earl R. CONTROL OF CULL TREES AND WEED SPECIES IN HARDWOOD STANDS. US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), Sta. Pap. no. 95. 1-13 p., 4 figs. Sept. 1958.

"The treated trees were divided into three size groups: small (0.6 to 4.9 inches in diameter), medium (5.0 to 11.9 inches in diameter), and large (12.0 inches and larger in diameter). In the small-size group, best treatments were a 2,4,5-T in oil basal spray for red maple and laurel, stumps treated with 2,4,5-T in oil for hickories and rhododendron, and stumps treated with Ammate crystals for oaks and sourwood. In the medium-size group, Ammate in cups was best for oaks and sourwood, ax-frills treated with 2,4,5-T was best for hickories, and none of the treatments was satisfactory for red maple. Oaks and hickories in the large-size group were successfully killed by girdling alone. However, the hickories tended to bridge over the machine-girdle, but did not bridge over the notch-girdle made with an ax."

MAMMALS--GENERAL

Gewalt, Wolfgang. ÜBER DAS SCHWIMMEN VON EICHHORN, SCIURUS VULGARIS FUSCOATER, FELDHASE, LEPUS E. EUROPAEUS, UND REH, CAPREOLUS C. CAPREOLUS. Säugetierk. Mitt. 5(4): 162-164. Dec. 1957. [From J. Mamm. 39(4).]

Holling, C. S. (For. Insect Lab., Sault Ste. Marie, Ontario.) SENSORY STIMULI INVOLVED IN THE LOCATION AND SELECTION OF SAWFLY COCOONS BY SMALL MAMMALS. Can. J. Zool. 36(5): 633-653, 4 figs. Oct. 1958.

Stimuli responsible for location and selection of healthy vs. diseased sawfly prepupae by Peromyscus m. bairdii, Sorex cinereus, and Blarina brevicauda were determined in all phases of the search for buried food. Only olfactory stimuli were involved in the digging, removing, and opening phases, while gustatory stimuli played a part in selection in the eating phase. There were innate preferences and aversions to the gustatory stimuli, but not to the olfactory stimuli. It was only with experience that the animals were able to associate odors from cocoons with the taste of the cocoon contents. The selection of healthy ♂ v. ♀ prepupae was also studied. In the digging phase, all species dug more holes over the larger ♀ cocoons than over the smaller ♂ cocoons. This selection was not affected by experience and was caused by differences in degree and not kind of odor. In the removing and opening phases, S. cinereus and P. m. bairdii removed and opened more ♂ than ♀ cocoons, while B. talpoides removed and opened more ♀ cocoons. This selection was affected by experience and probably resulted from differences in visual or tactile stimuli. The larger the mammal the greater was the selection for ♀ cocoons.--From auth. abst.

Legouix, J. P. L'AUDITION CHEZ LES MAMMIFÈRES. Mammalia 21(4): 396-404. Dec. 1957. [From J. Mamm. 39(4).]

Little, C. C. (Jackson Mem. Lab., Bar Harbor, Me.) COAT COLOR GENES IN RODENTS AND CARNIVORES. Quart. Rev. Biol. 33(2): 103-137. June 1958.
Authoritative review paper with 7 p. of references.

Riedesel, M. L., and G. Edgar Folk, Jr. (U. Iowa Sch. Med., Iowa City.) SERUM ELECTROLYTE LEVELS IN HIBERNATING MAMMALS. Am. Nat. 92(866): 307-312, 1 fig. Sept.-Oct. 1958.
"...records serum calcium and potassium measurements on four species of hibernating animals, including two species of bats, hamsters, and thirteen-lined ground squirrels."

Scott, John Paul. (Jackson Mem. Lab., Bar Harbor, Me.) AGGRESSION. U. Chicago Press. xi + 149 p., illus. 1958. $3.75. [From review by R. R. Sears, Science, Sept. 26, 1958.]
"...provides a good over-all view of what we know, to date, about the biological aspects of mammalian aggression... It is eminently readable...and the author has not hesitated to introduce thoughtful commentary on the social implications of his biological facts... Scott...describes the mechanics of the process by which animals learn to attack and to refrain from attacking and shows how the facts fit a starkly Pavlovian theoretical model... Successive chapters describe the physiology of aggressive behavior... The book is at its best when it treats of the lower animals--their physiology and the effects of their environments... Scott has chosen to emphasize the lower mammals and has done a good job of it. However, since he has had to display, also, important species differences, even among breeds of dogs, one cannot but wonder how applicable his conclusions are for an understanding of human aggression."

MAMMALS--FAUNAS AND MANUALS

Beck, W. H. (U. Sask., Saskatoon.) A GUIDE TO SASKATCHEWAN MAMMALS. Sask. Nat. Hist. Soc. (Sask. Mus. Nat. Hist., Regina), Spec. Publ. no. 1. 1-52 p., illus. 1958. 50¢.
Useful handbook. Includes keys to all groups down to species, and concise descriptions of all forms, including subspecies. Taxonomy appears to be up-to-date. Ranges in Sask. are described and specific localities are listed and spot-mapped for nearly all species. Data on distribution of larger mammals were supplemented by information from Sask. Wildlife Branch. The booklet gives brief description of area and its life zones, suggestions for collecting methods, selected references, and index. There are several photographs of animals and a few figures of technical characters referred to in keys. Too many of the key characters are not explained or illustrated, however, and too many of the key characters used are wholly relative, as "Skull light and slender" vs. "Skull robust". We also doubt the wisdom of trying to key Microtus pennsylvanicus from ochrogaster by color characters [see, for example, J. Mamm. 38(1): 44-52]. It is not clear whether measurements listed for spp. and ssp. are based on local specimens or taken from general references that are credited with being the source of descriptive material. Nevertheless, this paper should be of aid in identification, and it is a good source of data on distribution and occurrence.

Clark, W. Kim. (US F&WS, Kodiak, Alaska.) THE LAND MAMMALS OF THE KODIAK ISLANDS. J. Mamm. 39(4): 574-577, 1 map. Nov. 1958.
The famed Kodiak bear numbers about 2,000. The population is barely holding its own under a kill of about 200 a year, partly illegal. Bear habitat and food supplies are good, perhaps improving. This paper describes the islands and presents an annotated list. Indigenous species are Myotis lucifugus, Microtus oeconomus, Ursus middendorffi, Mustela erminea, Lutra canadensis, and possibly Citellus undulatus. Introduced and apparently established are snowshoe hare, red squirrel, beaver, muskrat, Norway rat, house mouse, Olympic elk, Sitka deer, reindeer, and mountain goat. Introduced, but perhaps not established, are mink and marten.

Lindsay, Dwight Marsee. MAMMALS OF RIPLEY AND JEFFERSON COUNTIES, INDIANA. Ph.D. thesis, U. Cincinnati. 113 p. 1958. [From short abstract in Dissertation Abstracts 19(4).]

Six-year study of taxonomy and distribution in relation to ecology of region.

Manning, T. H., and A. H. Macpherson. (37 Linden Terrace, Ottawa, Ont.) THE MAMMALS OF BANKS ISLAND. Arctic Inst. N. Am., Tech. Pap. no. 2. 1-74 p., 15 figs., 35 tables. Aug. 1958. $1.00 to members, $2.00 to nonmembers, paper cover, from Arctic Inst., 3485 Univ. St., Montreal 2, Quebec.

This paper is distinguished by the large amount of detailed statistical analysis of taxonomic features of pertinent races of arctic hare, brown lemming, and wolf. The situation uncovered in wolves is surprising, not to say weird. Less, but still considerable quantities of statistical analysis are devoted to racial problems of varying lemming and musk ox. Population estimate is given for caribou on Banks Is. Historical and biological notes are given for all local mammals, marine or terrestrial. Authors' abstract: "A record of field observations made during brief stops on Banks Island in 1951 and during the full summer seasons of 1952 and 1953 is given together with those observations of previous authors which aid in estimating the past or present abundance and distribution of the mammals. Thirteen species of mammals are or have been regular inhabitants of Banks Island or the surrounding seas; two other species have been recorded once. In 1952 and 1953, 128 skins and 274 skulls of mammals were collected, and the results of taxonomic studies of these and of other material (about 160 specimens) from Banks Island in the National Museum of Canada are given. A new race of Lepus arcticus and of Lemmus trimucronatus are described."

Pettit, Ted S. THE BOOK OF SMALL MAMMALS. Garden City Books, Garden City, N. Y. 56 p., illus. 1958. $2.95.

A handsomely illustrated book for youngsters. The 8.5 x 11 in. pages afford plenty of room for the many attractive drawings by G. Don Ray. About half of the pictures are in color and quite a few of them are pleasing views of animals in natural habitats. The cover picture of a raccoon at water's edge is one of the nicest mammal paintings we have seen. The text is a simple account of habits and distribution of Am. mammals. It treats mammals up to the size of otter and lynx. It goes down to species for well-known forms, and down approximately to genera for many groups of shrews and rodents. Pettit also explains what mammals are and gives several suggestions for ways in which mammals can be observed and their tracks can be studied. The book is generally accurate and, considering its purpose, need not be criticized technically. However, the animal illustrated as a hoary bat is obviously a very different bat. It seems questionable practice to recommend pit traps to children, who are likely to abandon these catch-alls after a few visits. Furthermore, a few selected references might well have been cited for the benefit of those whose interest in mammals is sharpened by this attractive book.

We have not seen the companion volume on large mammals, HOOFS, CLAWS AND ANTLERS, by Harold McCracken, illus. by Lee J. Ames. According to a notice in Nat. Mag., Jan. 1959, this book is from same publisher, has same number of pages, same date, same large format, but sells for $2.50.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Calhoun, John B., and James U. Casby. (Natl. Inst. Health, Bethesda, Md.) CALCULATION OF HOME RANGE AND DENSITY OF SMALL MAMMALS. US Pub. Health Serv., Pub. Health Monog. no. 55. iv + 24 p., 10 figs. 1958. 25¢ from Supt. Documents.

Mathematical and theoretical exploration. In 1st section, Home Range, mathematical expressions for travels of mice between traps are derived on the basis of stated assumptions. The authors find results of their equations in line with those of Dice & Clark and consider both satisfactory. [Present analysis has an advantage in that individual differences in range size are recognized, and a method is presented for transposing data so that records of individuals can be combined without bias. Disadvantages are arbitrary elimination of data for many mice, not only those with fewer than 10 captures, but also those whose ranges appear to shift, so that the equations show travels of

selected individuals rather than the population as a whole. Mice selected presumably are the "resident" animals that are often the primary concern of biologists. Assumptions underlying the analysis are not all firmly established ones: (1) "The home range is fixed." Data are selected as described above in order to fulfill this criterion. (2) "There is a true center of activity..." By definition, there is a true mathematical center of activity of which the apparent centers are estimates. In contrast, some field data suggest that there is no one center of biological activity; other data suggest that there is a center but that it is not reflected in the pattern of trap visiting. (3) "The probability of an animal being in a unit of area decreases with increasing distances from the true center of activity." Even when traps within the range are visited strictly at random, the calculated probability of capture decreases with increasing distances from the apparent center of activity. Extrapolation to the biological assumption, as quoted, may therefore not be sound. The implication (made in supplementary support of the assumption) that an increase of distances with number of captures is the same thing as an increase of distances with time is not in accord with results of many field studies.] In the next sections, certain data from N. Am. Census of Small Mammals are discussed and mathematical procedures are presented for estimation of densities from trap-line data. Estimates apparently depend on a knowledge of home range parameters that must be obtained by large-scale grid trapping. As pointed out in the following section, the parameters vary with sex, species, and habitat [also age, season, and year]. [The method therefore would seem to be of somewhat limited applicability.] Because of these changes in home-range parameters, use of trap-night or trap-line data to estimate relative densities is criticized, and an example is given concerning sex ratios obtained in the N. Am. Census. [Although these techniques do not measure relative densities precisely, it is unlikely that they fail to show major cyclic fluctuations.]--L. F. Stickel.

Miller, Richard S. (U. Saskatchewan, Saskatoon.) A STUDY OF A WOOD MOUSE POPULATION IN WYTHAM WOODS, BERKSHIRE. J. Mamm. 39(4): 477-493, 5 figs. Nov. 1958.

A population of Apodemus sylvaticus was studied by live-trapping, Jan. 1950-Mar. 1951, in a 5-acre copse in England. The 1950 breeding season extended from Mar. to Oct. with peak in May. The 1951 breeding season began in Jan. Early start of 1951 breeding is attributed to abundant food and, possibly, to relatively high population density in fall of 1950. Except for temporary migration of mice out of study area in July, the population reached its lowest density of 3.6 per acre in May. Maximum density of 10.9 per acre was reached in Nov. The overwintering population that was established by Nov. consisted entirely of mice born during 1950. Av. home range of ♂♂ captured 3 or more times was 3742 yards sq., or 0.72 acres; of ♀♀, 1158 yards sq., or 0.24 acres. Av. distances moved each month by ♀♀ were relatively constant. Males moved far greater distances during May to Sept. than at other times. This increased activity seemed correlated with breeding condition of ♀♀. Three types of movement were noted in recapture data: (1) home range, (2) home range + dispersal, (3) dispersal. There is, as yet, no objective method for handling recapture data so as to distinguish between home range and dispersal movements. The latter are, however, extremely important in the activity patterns of the population and influence estimates of home range considerably.--Author. [Another common and important type of travel must be considered: exploration and return (= trips).]

MAMMALS--PARASITES AND DISEASES

Bell, J. F., Cora R. Owen, and Wm. L. Jellison. (Rocky Mtn. Lab., Hamilton, Mont.) GROUP A STREPTOCOCCUS INFECTIONS IN WILD RODENTS. J. Infect. Dis. 103 (2): 196-203, 6 photos. Sept.-Oct. 1958.

Summary: "Group A streptococcal infections that occurred among small rodents during a period of abundance in Klamath County, Oregon, were characterized by swollen limbs and somatic abscesses. The infection rate, which was as high as 19% during winter, varied according to season and locality. Swiss white mice inoculated subcutaneously with large doses of the streptococcus usually succumbed; some mice that received smallest inocula developed lesions typical of the natural disease. In wild, naturally infected rodents, the disease was

relatively indolent and benign. Yet, by reason of deformities and consequent incapacitation, it was inimical to survival. The source of infection and the reason for the high morbidity rate in winter are unknown."

Eklund, Carl M., Glen M. Kohls, and Wm. L. Jellison. (Rocky Mtn. Lab., Hamilton, Mont.) ISOLATION OF COLORADO TICK FEVER VIRUS FROM RODENTS IN COLORADO. Science 128(3321): 413. Aug. 22, 1958.

McKeever, Sturgis, Wm. Kaplan, and Libero Ajello. (US Pub. Health Serv., Atlanta, Ga.) RINGWORM FUNGI OF LARGE WILD MAMMALS IN SOUTHWESTERN GEORGIA AND NORTHWESTERN FLORIDA. Am. J. Vet. Res. 19(73): 973-975. Oct. 1958.
Hair specimens from 1,758 small game and fur mammals were studied. Ringworm fungi were determined only through culture and were from only 1.1% of animals. All isolates of Trichophyton mentagrophytes were from opossums collected in areas frequented by domestic animals. "Lack of any evidence of infection in animals from which dermatophytes were isolated indicates that the fur of these animals may have been contaminated with spores from the environment, rather than being infected."

McKeever, Sturgis, R. W. Menges, Wm. Kaplan, and Libero Ajello. (US Pub. Health Serv., Atlanta, Ga.) RINGWORM FUNGI OF FERAL RODENTS IN SOUTHWESTERN GEORGIA. Am. J. Vet. Res. 19(73): 969-972. Oct. 1958.
Ringworm fungi were determined only through culture, for there were no apparent infections. The 11.4% of animals from which fungi were cultured may have been merely carriers of fungus elements picked up from the environment. Rate of occurrence of fungi on animals rose sharply as successional stage of area approached pure pine woodland.

McKeever, Sturgis, J. H. Schubert, G. W. Gorman, and R. D. Grimes. (US Pub. Health Serv., Atlanta, Ga.) COMPARISON OF BACTERIOLOGICAL AND SEROLOGICAL TECHNIQUES FOR DETECTION OF LEPTOSPIROSIS IN WILD MAMMALS. Am. J. Vet. Res. 20 (74): 192-197. Jan. 1959.
2501 wild mammals from sw. Ga. were examined for leptospirosis by culturing kidney tissue and by complement-fixation tests. Results of tests are reported in detail.

McKeever, Sturgis, J. H. Schubert, M. D. Moody, G. W. Gorman, and J. F. Chapman. (US Pub. Health Serv., Atlanta , Ga.) NATURAL OCCURRENCE OF TULAREMIA IN MARSUPIALS, CARNIVORES, LAGOMORPHS, AND LARGE RODENTS IN SOUTHWESTERN GEORGIA AND NORTHWESTERN FLORIDA. J. Infect. Dis. 103(2): 120-126, 2 figs. Sept.-Oct. 1958.
From summary: Serums from 2004 mammals of 13 species were tested for agglutinating antibodies of tularemia; 344 were positive at titers of 1:80 or higher. Hosts and incidences of infection were: opossum, 11.9%; cottontail, 0.5%; fox squirrel, 2.5%; red fox, 11.5%; gray fox, 24.3%; raccoon, 24.9%; striped skunk, 21.5%; spotted skunk, 12.5%; bobcat, 22%; feral house cat, 6.2%. Eighty spleens were examined in attempt to isolate P. tularensis; 1 was positive--a highly virulent strain was recovered from an opossum. Incidence of infection in mammals increased as the density of the vegetative cover of the habitat increased; thus incidence was high in areas with many swamps and bottomland forests. All of the hosts discussed here are hunted for food, sport, or fur, and thus constitute both a direct and indirect potential source of infection for man.

Vest, E. Dean, and Nyven J. Marchette. (Ecol. Res., U. Utah, Dugway.) TRANSMISSION OF PASTEURELLA TULARENSIS AMONG DESERT RODENTS THROUGH INFECTIVE CARCASSES. Science 128(3320): 363-364. Aug. 15, 1958.

SHREWS, MOLES, BATS

Anon. RABIES IN BATS. J. Am. Vet. Med. Assn. 133(11): 544. Dec. 1, 1958.
Three reports from "Morbidity and Mortality," which is issued weekly by U. S. Dept. Health, Ed., and Welfare. A rabid bat in Fla. entered car window and attacked driver. Rabid bat in Pa. entered window and attacked man in bed. In N. M., a moribund bat was found to have rabies; about 15 other bats had been found dead or dying in the vicinity.

Conaway, C. H. (U. Mo., Columbia.) MAINTENANCE, REPRODUCTION AND GROWTH OF THE LEAST SHREW IN CAPTIVITY. J. Mamm. 39(4): 507-512, 1 graph. Nov. 1958.
Summary: "Information about the maintenance and behavior of Cryptotis parva in captivity is given. This species is well adapted to captivity and it shows much less aggressive behavior than is reported for other soricids. Gestation is 21 to 23 days from the last observed copulation. A post-partum pregnancy was observed in one of three females which were with males after giving birth to a litter. Cryptotis are weaned after 21 days. A weight growth curve is given."

Constantine, Denny G. (US Pub. Health Serv., Carlsbad, N. M.) BLEACHING OF HAIR PIGMENT IN BATS BY THE ATMOSPHERE IN CAVES. J. Mamm. 39(4): 513-520. Nov. 1958.

Griffin, Donald R. (Harvard U., Cambridge, Mass.) MORE ABOUT BAT "RADAR". Sci. Am. 199(1): 40-44, illus. July 1958.
"A sequel to an earlier article which described the capacity of bats to locate objects by supersonic echoes. This natural sonar is now known to incorporate extraordinary refinements."

Griffin, Donald R., and Alan D. Grinnell. (Harvard U., Cambridge, Mass.) ABILITY OF BATS TO DISCRIMINATE ECHOES FROM LOUDER NOISE. Science 128(3316): 145-146, 1 fig. July 18, 1958.

Jennings, Wm. Lamar. THE ECOLOGICAL DISTRIBUTION OF BATS IN FLORIDA. Ph.D. thesis, U. Fla. 135 p. 1958. [From Dissertation Abstracts 19(5).]
Data for 15 species concerning: range and regional abundance (including maps), habitats, life history, mortality rates, and migration. Distribution is influenced most strongly by availability of roosting sites, but also by distribution of plant communities. There is correlation between roosting habits, mortality rates, and number of young in litters.

Klemmer, Konrad. EINE METHODE ZUM FANG FLIEGENDER FLEDERMÄUSE. Säugetierk. Mitt. 5(3): 118-120. Aug. 1957. [From J. Mamm. 39(4).]

Rood, John P. (1615 Dover Rd., Kalamazoo, Mich.) HABITS OF THE SHORT-TAILED SHREW IN CAPTIVITY. J. Mamm. 39(4): 499-507. Nov. 1958.
Summary: "Thirteen short-tailed shrews were trapped alive in Kalamazoo, Michigan, from October 19 to December 31, 1956. They proved to be very hardy under all conditions of captivity. Observations were made on their senses, activity times, sleeping posture, cleaning habits, voice and digging habits. The shrews ate a wide variety of foods. They were unable to catch Peromyscus except in very small cages and, even then, some would not attack a mouse. When a mouse was killed, it took the shrew about 30 minutes to complete the task. Several shrews could be kept in the same cage with only occasional quarrels. As many as five, of both sexes, lived amicably with each other and slept curled together in piles. Males in small cages usually fought among themselves, but two could live together if the cage was large enough. In general, young shrews and females were less pugnacious than adult males. The shrews showed marked individual differences in many aspects of their behavior."

Rood, John P. (1615 Dover Rd., Kalamazoo, Mich.) NOTES ON A CAPTIVE MOLE. J. Mamm. 39(4): 583-584. Nov. 1958.
Behavior of a captive Scalopus aquaticus.

Schindler, R., and H. K. Dennig. THE ROLE OF BATS IN RABIES IN EUROPE. Monatsh. f. Tierheilk. 10: 169-177. 1958. [From J. Am. Vet. Med. Assn. 134(2): 92.]
Rabies has been identified in insectivorous bats in Germany and Jugoslavia. These bats have little contact with other species, and presumably transmit rabies to them only during the relatively short stage of excitation. Unlike Am. bats, they have no chance to come into contact with vampire bats. Epidemiologically, the disease progresses uniformly in Europe instead of occurring sporadically as it would if bats were responsible. However, bats are well suited to serve as reservoirs during periods when the area is free of clinical evidence of rabies.

RABBITS AND PIKAS

Beidleman, Richard G., and Wm. A. Weber. (U. Colo., Boulder.) ANALYSIS OF A PIKA HAY PILE. J. Mamm. 39(4): 599-600. Nov. 1958.

Bronson, Franklin H., and Otto W. Tiemeier. (Kans. State Coll., Manhattan.) REPRODUCTION AND AGE DISTRIBUTION OF BLACK-TAILED JACK RABBITS IN KANSAS. J. Wildl. Mgt. 22(4): 409-414. Oct. 1958.

904 Lepus californicus melanotis were collected in 17 months during 1956-57. A definite breeding season of approximately 220 days was noted. An estimated av. of 3.8 litters and 2.6 fetuses per litter was obtained from 32 pregnancies. The fall age ratio was 71% young of year in 1956 and 82% in 1957. Eight % of embryos examined were undergoing resorption.--Authors.

Cardinell, H. A. (Mich. State U., East Lansing.) AN EFFECTIVE REPELLENT FOR EUROPEAN HARE IN BRAZIL. J. Wildl. Mgt. 22(4): 435-436, 1 photo. Oct. 1958.

Lepus europaeus in the state of Rio Grande do Sul, Brazil, injured trunks of young apple, pear and plum. A varnish made of 7 lbs. of wood rosin dissolved cold in 4 qts. of ethyl alcohol, when painted on bark of 1 to 4-year-old apple trees, was completely effective the first winter. It was nearly as effective after weathering a year. Common varieties of apple, pear and plum comprised the planting. Both diameter of stem and species of tree determined preference. Data were pooled (1) for all trees 1 in. and less in diameter, and (2) for trees between 1.5 in. and 2 in. Both sets of data indicated that plums were least damaged.--Author.

Fraguglione, Dante. (Case Stand 333, Genève, Switz.) THE MILK TEETH OF FIELD HARES. Z. Jagdwissensch. 3(4): 141-145, 4 figs. 1957.

In German with English summary. Young L. europaeus have 12 deciduous teeth (2 upper incisors, 6 upper premolars and 4 lower premolars) that are lost by the age of 4 weeks. Premolars are rooted. Adult incisors appear at the age of 25-35 days and adult has 28 permanent teeth.--V. F. Flyger.

Grant, Philip T. (Forked River Game Farm, N. J. Div. Game.) EXPERIMENTAL COTTONTAIL RABBIT PRODUCTION. N. J. Outdoors 9(7): 7-12, 11 photos. Jan. 1959.

N. J. has begun experimental propagation of cottontail rabbits in large pens with artificial food and cover. Results were poor the first year, 1957, but were encouraging in 1958, when 336 young were transferred from breeding to holding pens. Grant's paper gives many details of the project, and a preceding paper by J. W. Marron, Sr. in the same issue gives more background on the project and the pen layout.

Haas, Glenn E., and Robert J. Dicke. (U. Wis., Madison.) ON CUTEREBRA HORRIPILUM CLARK (DIPTERA: CUTEREBRIDAE) PARASITIZING COTTONTAIL RABBITS IN WISCONSIN. J. Parasit. 44(5): 527-540, 2 text figs., 11 figs. on 2 pl. Oct. 1958.

Deals with seasonal incidence of Cuterebra on cottontails near Madison, and gives much information on life history and morphology of the parasite.

Hewson, Raymond. (Dufftown, Banffshire, Scot.) MOULTS AND WINTER WHITENING IN THE MOUNTAIN HARE LEPUS TIMIDUS SCOTICUS, HILZHEIMER. Proc. Zool. Soc. London 131(1): 99-108. July 1958.

Johnson, Ancel M., and George O. Hendrickson. (Iowa State Coll., Ames.) EFFECTS OF WEATHER CONDITIONS ON THE WINTER ACTIVITY OF MEARNS COTTONTAIL. Proc. Iowa Acad. Sci. 65: 554-558. Nov. 1958.

"In summary, the analysis of the live-trapping data and weather conditions indicated that trap success was highest during or immediately following periods of rising barometric pressure. No correlation was found between precipitation, maximum and minimum temperatures and trap success. There was not a significant correlation between the total change in barometric pressure between 6 p.m. and 6 a.m. and trap success per night. Multiple regression and correlation methods were applied to the number of cottontails observed during the line-count routes, temperature, wind velocity, barometric pressure and snow depth. The coefficients of multiple correlation and regression were not significant for any of the routes. The simple correlation coefficients for snow and numbers of cottontails

observed were significant at the 95 percent confidence level for the morning routes on Area A and the afternoon routes on Area B. The values for the other two routes were comparatively high but not significant. This relationship indicates that more cottontails were observed when snow was on the ground than when snow was absent."

Kirkpatrick, Ralph D. (Ind. Dept. Cons.) SAN JUAN RABBIT INVESTIGATION. Ind. Quart. Prog. Rep. 19(2): 79-107. July 1958.

This PR job completion report consists of 2 parts. The first part is a 5-p. digest of what is known about Oryctolagus cuniculus all over the world. This discussion is presented under the following headings: Classification and distribution, Physiology, Reproduction, Diseases and parasites, Mortality, Behavior, Ecology, Damage, and Control. This digest is, of course, selective and suggestive rather than complete. The second part, p. 84-107, is the most extensive list of references on the European rabbit that we have seen. It includes about 400 titles arranged by subject.

Kötsche, W. CONTRIBUTION TO THE PATHOLOGICAL ANATOMY AND HISTOLOGY OF MYXOMATOSIS FOLLOWING EXPERIMENTAL INFECTIONS. Arch. Exp. Vet. Med. 8(5): 675-691. 1954. [From German abstract by Mendheim in Z. Jagdwissensch. 3(3).]

In German. Full description of gross and microscopic characteristics of tissues and organs of laboratory-infected rabbits.--V. F. Flyger.

Lechleitner, R. R. (MVZ, U. Calif., Berkeley.) MOVEMENTS, DENSITY, AND MORTALITY IN A BLACK-TAILED JACK RABBIT POPULATION. J. Wildl. Mgt. 22(4): 371-384, 5 figs. Oct. 1958.

A population of Lepus californicus was studied on the Gray Lodge Waterfowl Mgt. Area, Butte County, Calif., from Oct., 1954 to March, 1956. Two methods were used: 1 consisted of necropsy of hares killed in each month of the study period; the other consisted of capturing, tagging, releasing, and observing hares. A total of 677 trap nights resulted in the capture of 143 jack rabbits; 100 were tagged and released. Observations on tagged animals indicate that these hares have rather well-defined home ranges of less than 50 acres. There is considerable overlap of individual home ranges at the observed density of about 1 jack rabbit per acre. Size of home range seems to be determined by the pattern of food, water, and cover in the environment. Shifting, expansion, and contraction of home ranges allow for quick population of fields that were formerly unsuitable habitat. Jack rabbits driven from their home ranges may return to them. Automobiles and fires may kill considerable numbers of hares. Predators, except dogs, appear to have little influence on the adult population. Greatest losses of marked hares occurred in winter. During and after a winter flood in 1955-56, 150 carcasses were found. About 20% of these deaths probably were caused by intestinal coccidiosis; the remainder appeared to have died of a condition resembling shock disease.--Author.

McGinnes, Burd Sheldon. (V.P.I., Blacksburg, Va.) SOME FACTORS INFLUENCING THE COTTONTAIL RABBIT IN SOUTHWESTERN VIRGINIA. Ph.D. thesis, Va. Poly. Inst. 1-127 p., 20 figs. Jan. 1958.

Tularemia killed most of the rabbits stocked in a large pen. The disease was dormant Nov.-Apr. Tularemia may be cause of drastic local declines in rabbit populations. Use of malathion-toxaphene spray to control local vectors was promising, but apparently killed some rabbits. Parasitism and predation were negligible causes of mortality. Provision of brush piles increased rabbit use of an area by 16.6%. Heavy stocking of an area that already had cottontails did little if any good; it may even depress a population. Rabbits displayed homing instinct; this may affect dispersal of transplants. Maximum population density encountered was 5.4 rabbits per acre and an 8:1 ratio of young per adult ♀. Removal of hundreds of rabbits from an area in spring and fall indicated that rabbits can be controlled but not eliminated by intensive trapping. Accurate determination of age by external features seemed to be unreliable before age of 40 days. Rabbits definitely preferred rape grown on fertilized soil to that grown on unfertilized soil. There appeared to be a correlation between high populations and medium to high soil fertility. Unbaited traps were as effective as baited ones. Ear tags of aluminum-washer type were highly satisfactory. Marks of picric acid and printers ink were not satisfactory.

Stannard, Lewis J., and Lysle R. Pietsch. (Ill. Nat. Hist. Surv., Urbana.) ECTOPARASITES OF THE COTTONTAIL RABBIT IN LEE COUNTY, NORTHERN ILLINOIS. Ill. Nat. Hist. Surv. Div., Biol. Notes no. 38. 1-18 p., 14 figs. June 1958. Single copies free on request.

More than 10,000 ectoparasites of 7 species were collected from more than 700 rabbits in a 2.5-year period. Haemaphysalis leporis-palustris, the principal tularemia vector, was commonest tick. Adults were commonest in spring, and were rare from late autumn to late winter. Larvae were most abundant on rabbits in Aug.-Sept., nymphs in Sept.-Oct. Dermacentor variabilis, the main vector of spotted fever, was found chiefly in spring, and even then only larvae and nymphs of this tick were collected from rabbits. The eastern rabbit tick, Ixodes dentatus, was rare although nearly restricted to rabbits. The commonest flea, Cediopsylla simplex, was found throughout year, especially in spring. It occurred mainly on head and neck. Odontopsyllus multispinosus occurred sparingly at all seasons. This large flea preferred the hind quarters. Four other fleas found on rabbits probably were accidental; their usual hosts were other animals. The commonest bot was Cuterebra buccata. No chiggers were found on rabbits. Illustrations include 4 maps of known Ill. distribution of parasites and some excellent photographs of parasites.

Wodzicki, K., and R. H. Taylor. (DSIR, Wellington, N. Z.) AN EXPERIMENT IN RABBIT CONTROL. KOURARAU POISON TRIALS. New Zealand J. Sci. and Tech., Ser. B 38(5): 389-399. 1957. [From Biol. Abst. 32(12).]

An experiment to test the comparative efficiency of 1080 and arsenic trioxide for rabbit control was carried out in 2 adjacent pens of 10 and 14 acres. All rabbits dead above ground were collected. Burrows were dug out, and all rabbits, dead or alive, were obtained. In the 1080 pen 98%, and in the arsenic 77% of rabbits were killed. In the former, 2/3 of the dead rabbits were found on surface, but in the latter only 1/3. In the whole population there were more females than males, and the bias was even greater among survivors in the arsenic pen; a selective effect of arsenic is suggested. More than 2/3 of population were animals less than 2.5 years old. Among survivors in the arsenic pen there was a significantly higher proportion of old rabbits than in the original population, and of these 60% were females. The collection of all rabbits demonstrated a population density of 11 rabbits per acre. Following complete destruction of warrens by digging, re-infestation occurred, and within less than a year a light density similar to that of adjacent areas was reached.--From auth. summ.

RODENTS--MISCELLANEOUS

Anon. VERMONT PORCUPINE PROGRAM. US F&WS, 59 Temple Place, Boston 11, Mass. 6 p. Oct. 23, 1958.

Vermont set up $10,000 for porcupine control, sent out a questionnaire to obtain data on areas of damage, and hired a force of 4 men for 14 weeks. Work was done in winter of 1957-58 when snow was on ground and animals were denned in concentration areas. Apples poisoned with sodium arsenite were placed in dens. All porcupines seen were shot. 51 of the 230 concentration areas were checked and retreated. One treatment gave control of from 80% to 100%. Estimated porcupine population was 2,224 on 23,000 acres. The program presented very little danger to other wildlife; apples went to mush in 10 days. The method was used at a season when ♀ porcupines were pregnant, the animals had small ranges, were denned up in large numbers, and were easily located. A more durable and selective bait is still needed. Data are given on costs and results of the program.

Beer, James R., and Edwin F. Cook. (U. Minn., St. Paul.) THE LOUSE POPULATIONS ON SOME DEER MICE FROM WESTERN OREGON. Pan-Pacific Ent. 34(3): 155-158. 1958. [From Biol. Abst. 32(12). No abst.]

Chew, Robert M. (U. of S. Calif., Los Angeles.) REPRODUCTION BY DIPODOMYS MERRIAMI IN CAPTIVITY. J. Mamm. 39(4): 597-598. Nov. 1958.

Care and feeding in captivity; external cyclic changes of ♀.

Cook, Edwin F., and James R. Beer. (U. Minn., St. Paul 1.) A STUDY OF LOUSE POPULATIONS ON THE MEADOW VOLE AND DEER MOUSE. Ecology 39(4): 645-659, 6 figs. Oct. 1958.

Thorough study of incidence and abundance of Hoplopleura acanthopus on Microtus pennsylvanicus and H. hesperomydis on Peromyscus m. bairdii throughout the year. Seasonal and sexual differences are considered in detail.

Dana, Richard H., and Donald H. Shaw. (Calif. Dept. Agr., Bur. Rodent & Weed Control.) MEADOW MOUSE CONTROL IN HOLLY. Calif. Dept. Agr. Bul. 47(3): 224-226. July-Sept. 1958.

Microtus did much damage to a heavily mulched holly plantation. Various control methods were tested. Steam-crushed whole oats were accepted far better than other baits. Bait stations made of milk cartons were well used by mice the first night. Ground spray of 2 lbs. endrin per acre eliminated mice at cost of $20.93 for chemical. Toxaphene was ineffective at 4 and 6 lbs. per acre and about 80% effective at 8 lbs. per acre (cost $6.90). A 5% Cefro polyvinyl acetate emulsion gave protection for about 31 days--too short a time. Authors recommend use of poison baits in summer when population is low, and use of endrin spray if population is already high and presents immediate hazard. Endrin has more lasting power in cool weather. Microtus can be controlled and Peromyscus partly spared by using zinc phosphide instead of 1080 for treating baits.

Davis, W. B. (Texas A & M Coll., Coll. Station.) INVASION / COTTON RATS PLAGUE SOUTH TEXANS AS THEIR POPULATION SOARS. Texas Game & Fish 16(10): 8-9, 1 photo. Oct. 1958.

Rains that broke the drought in 1957 brought not only good crops, but good food and cover for Sigmodon. The resultant outbreak extended from Crystal City, Texas, north into Kans. The infestion occurred along the w. edge of the range of optimum conditions for cotton rats. Damage to various crops ranged up to 90%. Control efforts were about as effective as trying to empty the ocean with a spoon. Disease was beginning to appear in fall of 1958, and the population was expected to crash, mainly because of disease, early in 1959. Peak populations of cotton rats appear in central Texas about every 10 years. The author gives a concise summary of cotton rat life history. He also gives figures on reproductive potential to show how rapidly a Sigmodon population can increase: 100 mated ?? at the beginning of 1957 could increase to 335,000,000 rats by mid-1958 if all lived. The basic data for this calculation are presented.

Finley, Robert B., Jr. THE WOOD RATS OF COLORADO: DISTRIBUTION AND ECOLOGY. U. Kans. Publ., Mus. Nat. Hist., 10(6): 213-552, 34 pl., 8 figs. Nov. 1958.

A long, impressive work that provides a good study of taxonomy and masses of detail on ecology. Colorado has more kinds of wood rats than any other state: 6 species, 12 subspecies. Two or 3 species occur together in some areas. Finley analyzes individual, age, and geographic variation at length, gives keys to all forms (illustrations of cranial features would have helped in use of keys), supplies range maps, describes and compares the species and races, and thoroughly discusses taxonomic problems. The second and larger section of the volume is on ecology. This part is based mainly on study of many dens and their surroundings. It is presented with much descriptive detail and many habitat photos. For each species are discussed: habitat, den, food, storage, reproduction and young, molts, parasites, injuries and diseases. There is much good, new information in this section, and it represents an enormous amount of careful work, but it is obscured to some extent by the quantity of data given on individual dens and sites. Later sections discuss "Competition and ecologic divergence," and "Physical and biotic factors controlling distribution." Food is chiefly coarse, leafy or pulpy vegetation of little economic importance to man. Such food is abundant and can hardly be a limiting factor or cause of much competition. Rather, competition is for den sites. Different species can live in a single area partly because they have different den preferences and habitat preferences--and some differences in food habits. Factors that limit distribution are believed to include low temperatures, river barriers, lack of suitable rock outcrops or shrubs for dens, and competition with other species of wood rats--mainly for dens.

Frank, Fritz. THE BREEDING POTENTIAL OF THE FIELD MOUSE, MICROTUS ARVALIS (PALLAS) - A MAXIMUM OUTPUT FOR MAMMALS. Z. Säugetierk. 21(3/4): 176-181. 1956 (1957). [From German abstract by Müller-Using in Z. Jagdwissensch. 3(4).]

In German. [This paper was listed by title in WR 91 p. 54.] Weight of a newborn litter may be more than 50% of mother's weight. A ♀ may produce a maximum of 33 litters with a total of 127 young. Maximum litter size in wild is 12, av. 7. Young are born Feb.-Oct. and under favorable conditions may be born in winter. Thirteen-day-old ♀♀ (weighing 7-9 gm.) copulate and are fertile. Twelve-gram wild mice have been found with embryos 3-4 mm. long. First litter can be born when mother is 33 days old. Many wild ♀♀ have young by the age of 40 days. Young are nursed until 17 days old, but attain puberty while nursing. K. Müller found that the same condition occurs in weasels.--V. F. Flyger.

Jameson, E. W., Jr. (U. Calif., Davis.) CONSUMPTION OF ALFALFA AND WILD OATS BY MICROTUS CALIFORNICUS. J. Wildl. Mgt. 22(4): 433-435. Oct. 1958.

Captive field mice ate 9.8 g. of alfalfa and 7.6 g. of wild oats, dry weight, daily. On an acre of sheep pasture, 100 mice would consume 12% to 13% as much forage as 10 growing lambs. In an alfalfa field, 100 mice would destroy about 4% of an annual production of about 11 tons.--Author.

Kryltsov, A. I. MATERIAL ON THE MOULTING IN MURIDAE. I. MOULTING IN MASS SPECIES OF MICROTINAE IN NORTHERN KAZAKHSTAN. Zool. Zh. 37(2): 271-286. Feb. 1958. [From J. Mamm. 39(4).]

In Russian with English summary.

McLaughlin, Charles Albert. A TAXONOMIC STUDY OF THE POCKET GOPHERS, GENUS GEOMYS, OF THE CENTRAL UNITED STATES. Ph.D. thesis, U. Ill. 298 p. 1958. [From Dissertation Abstracts 19(5).]

19 geographic races of G. bursarius, 7 races of G. personatus, and 2 races of G. arenarius are recognized within the range. Critical comments are made on morphological and ecological variations within species. Relationships and history of distribution are discussed. "All living Geomys appear to have originated with a lutescens-like form whose range included the western great plains area. During the Pleistocene the range of the southeastern U. S. pocket gophers was separated from the range of G. bursarius."

Nero, Robert W. (Sask. Mus. Nat. Hist., Regina.) BEHAVIOR OF A CAPTIVE POCKET MOUSE. Blue Jay 15(4): 173-176, 6 figs. Dec. 1957.

Starrett, Andrew. INSULAR VARIATION IN MICE OF THE MICROTUS PENNSYLVANICUS GROUP IN SOUTHEASTERN MASSACHUSETTS. Ph.D. thesis, U. Mich. 149 p. 1958. [From informative abstract in Dissertation Abstracts 19(4).]

Detailed study of variation in mice from several islands. "The general conclusions which can be drawn from this study are (1) that the differences which now are evident between insular populations of Microtus in southeastern Massachusetts have arisen through natural selection and/or random fixation of genes in the last 11,000 years and (2) that length of time of isolation, population size, and effective predation have influenced the amount of differentiation which occurred in each population. The status of Microtus breweri as a species is reaffirmed." [On the other hand, M. breweri is said to represent the end of clines in size and color, which does not suggest specific status.]

RATTUS AND MUS

Lynch, F. G. (City Dept. Health, Berkeley, Calif.) BERKELEY'S SEWER POISONING PROGRAM FOR RODENT CONTROL. Calif. Vector Views 5(11): 71, 74. Nov. 1958.

"Before sewer poisoning began upwards of 10,000 rats were recovered each year as a result of poisoning and trapping activities throughout the City. In 1957, less than 600 rats were recovered." The basic technique is to place 1080-treated barley on a ledge in each manhole that has rodent droppings on the ledge. Methodology is explained. In Berkeley, where there are about 1000 manholes to be inspected, 2 men can do the whole job, including reinspection and cleanup, in about 3 weeks.

Mohr, Carl O. (Ill. Nat. Hist. Survey, Urbana.) RELATION OF MEAN NUMBER OF FLEAS TO PREVALENCE OF INFESTATION ON RATS. Am. J. Trop. Med. & Hygiene 7 (5): 519-522, 1 fig. Sept. 1958.

Thousands of rats were studied in various parts of se. U. S. The flea involved was Xenopsylla cheopis. Increase in fleas per rat, probably accompanied by increased activity of fleas and rats in spring, induced an increased prevalence of infestation. Decrease in fleas per rat induced decline in prevalence. One or 2 annual periods of increase and decrease were found in different areas, depending on climatic zone. These peaks are related to prevalence of human typhus and would be related to that of plague, if this disease were present.

SCIURIDS

Broadbooks, Harold E. (S. Ill. U., Alton.) LIFE HISTORY AND ECOLOGY OF THE CHIPMUNK, EUTAMIAS AMOENUS, IN EASTERN WASHINGTON. U. Mich., Mus. Zool., Misc. Publ. no. 103. 1-42 p., 3 pl., 6 figs. July 1958. 95¢, paper.

Carefully presented factual information and discussion of data from live trapping and observations during 11 months of 1946-7, supplemented by data from captive animals. Topics: breeding cycle, litter size, growth and development, weights, dens and nests, foods and feeding habits, winter food stores, behavior, hibernation, longevity, parasites, and relationships with Citellus lateralis, which occupies the same habitat.--L. F. Stickel.

Creed, Wm. A., and Ward M. Sharp. (Pa. State U., U. Park.) MELANISTIC GRAY SQUIRRELS IN CAMERON COUNTY, PENNSYLVANIA. J. Mamm. 39(4): 532-537, 1 photo. Nov. 1958.

Summary: "Though now found on only a remnant of its former range, the black squirrel is still abundant on the Allegheny Plateau in Pennsylvania. A gray-black squirrel population was studied in Cameron County, Pennsylvania, from August, 1955, to February, 1957. Color ratios of squirrels live-trapped and killed by hunters indicated a reduced black:gray ratio since 1920. Selective shooting is presented as a possible factor contributing to the decline of the melanistic phase. The sex ratio of 143 melanistic squirrels was 93 males to 100 females. Three color variations of melanistic squirrels are described. The presence of genes affecting distribution of black pigment is a probable cause of the wide range of melanistic saturation found in individual squirrels."

Dasgupta, B., and Kamani Meedeniya. (London Sch. Hygiene & Trop. Med., Eng.) THE VECTOR OF HEPATOZOON SCIURI. Parasit. 48(3/4): 419-422, 7 figs. Nov. 1958.

Stages of sporogony were demonstrated in fleas, Orchopeas wickhami, in England, apparently from Sciurus carolinensis.

Gewalt, W. THE SQUIRREL (Das Eichhörnchen). "Die Neue Brehm-Bücherei." A. Ziemsen Verlag, Wittenberg, Germany. Pages not stated. 1956. 3 DM., boards. [From German abstract by Koenig in Z. Jagdwissensch. 3(4).]

In German. Sciurus vulgaris fuscoater is the only subspecies of squirrel found in Germany. Among subjects discussed in this book are: home range, methods of locomotion, nest structure, and feeding. Exploitation is slight in Germany, but in the Soviet Union squirrels comprise 1/3 of the wildlife harvest. Well illustrated.--V. F. Flyger.

Harris, Alva Howard. A STUDY OF GRAY SQUIRREL POPULATIONS ON EXPERIMENTAL NEST BOX AREAS. M. S. thesis, N. C. State Coll. xi + 128 p., 36 figs. July 1958.

Kidd, J. B. (La. Wild Life Comm.) SQUIRREL HUNTS ON MANAGED AREAS. La. Cons. 10(12): 4-5, 30, 3 photos. Dec. 1958.

A table of hunting-success data for the Thistlethwaite game management area shows that 5589 gray squirrels were killed in 2860 hunts, an average of fewer than 2 per hunt. Only 3.8% of the hunts produced the bag limit of 8. The author believes that the size of the bag-limit had very little to do with the total kill: his calculations showed that increasing the limit to 10 would have increased the take by less than 1%. Other calculations from data for marked squirrels indicated a kill of 13-16% of the population.--L. F. Stickel.

Kilham, Lawrence. (7815 Aberdeen Rd., Bethesda, Md.) RED SQUIRRELS FEEDING AT SAPSUCKER HOLES. J. Mamm. 39(4): 596-597. Nov. 1958.
"In conclusion, sapsuckers make holes which provide sap for a swarm of commensals ranging from butterflies and hornets to red squirrels and a variety of birds as elsewhere described."

Layne, James N., and Glen E. Woolfenden. (U. Fla., Gainesville.) GRAY SQUIRRELS FEEDING ON INSECTS IN CAR RADIATORS. J. Mamm. 39(4): 595-596. Nov. 1958.

Musacchia, X. J. (St. Louis U., St. Louis 4, Mo.) OBSERVATIONS ON A NEWBORN LITTER OF CITELLUS UNDULATUS. J. Mamm. 39(4): 594-595. Nov. 1958.
Brief account of growth and development.

BEAVER

Hay, Keith G. (Colo. Dept. Game & Fish, Denver.) BEAVER CENSUS METHODS IN THE ROCKY MOUNTAIN REGION. J. Wildl. Mgt. 22(4): 395-402, 1 map. Oct. 1958.
Thirteen beaver colonies were investigated over 2 summer and fall periods. Live and dead-trapping, pond draining, ground observations, and dislodging with smoke were tested in obtaining basic colony-composition data. Only dead-trapping proved quick and reliable as an intensive census method. Beaver dams, scent mounds, size of main lodge, and number of lodges proved invalid as population indices. The lodge was not indicative of the colony; one colony may keep at least 3 different lodges in good repair. Colonies subsisting on aspen contained a significantly larger number of individuals (7.8) than colonies subsisting on willow (5.1). Over-wintering colonies av. 6.3 ± 1.3 beavers. Aerial coverage of drainages, using the food cache as an index, was both accurate and practical. There was always 1 food cache per colony and the cache, always surrounded by water, could be recognized easily. A reliable census of beaver populations in mountainous terrain may be obtained by counting the number of food caches in an area in late Sept. or Oct. and multiplying by av. number of beavers per winter colony.--Author.

MUSKRAT AND NUTRIA

Krear, H. Robert. (Thorne Ecol. Res. Sta., 1707 Hillside Rd., Boulder, Colo.) AN ECOLOGICAL STUDY OF THE MUSKRAT IN THE LARAMIE AREA. M. S. thesis, U. Wyo. 172 p. 1953.
This study of O. z. cinnamominus was made 1949-51, in Albany Co., Wyo. Investigation included study of vegetation and its utilization in house construction and for food. Data on populations, seasonal movements, sex ratios, weights, skull and body measurements, and growth rates were presented. Study of reproduction provided data on seasonal changes in size of testes; time of reproduction; and litter sizes as determined from fetal and placental-scar counts. Observations were made on natural mortality, predation, parasites, and seasonal changes in pelt primeness. Development of primeness was described for age groups. Economic importance of muskrat was discussed. Suggestions were presented for management of muskrat in Wyo.--Author.

Kyle, George. THE NUTRIA NEEDS HUNTING. Ala. Cons. 30(3): 8-9, 22, 5 photos. Oct.-Nov. 1958.
Nutria were stocked ill-advisedly in the Mobile Delta of Ala. and have increased greatly. They are blamed for "thinning of the canes and other marsh plants, the recent unusual erosion of marshlands by tide action, scarcity of the muskrat population, and filling in of duck hunting areas with silt... A study in 1956 of duck food plants around Mobile showed that waterfowl foods are plentiful there. All the nutria seems to be doing is denuding the marsh so that tide and river waters erode established land areas filling channels and old established bays where duck hunters have hunted in the past." Already a few colonies of nutria have been found far northward on streams in Ala. Reduction of nutria is greatly needed, especially on the Delta. Sport hunting is encouraged. The animal is good eating and can be hunted the year 'round.

This article describes a hunt with dogs for nutria in the marsh. Nutria were found every few minutes. Groups of hunters have no trouble killing 20-30 a day and sometimes get many more. A pelt is worth $1-2 and there is some market for the meat in Mobile.

FUR ANIMALS, GENERAL

Schwartz, Morton J., and Myrtis L. Byrnes. (Bus. & Defense Serv. Admin., US Dept. Comm.) FUR FACTS AND FIGURES / A SURVEY OF THE UNITED STATES FUR INDUSTRY. 2d ed. Bus. & Defense Serv. Admin., US Dept. Comm. 1-19 p. 1st ed., 1955; revised, July 1958. 15¢ from Supt. Documents.

"This survey of the fur industry of the United States includes a short history of the industry, descriptions of the 40 fur animals supplying the more important furs used by the industry, and foreign trade statistics showing the importance of this country as an importer, exporter, and reexporter of furs. It is designed to fill the need often expressed by the fur industry--dealers, manufacturers and distributors--for a brief, nontechnical summary of the subject." Although zoologically naive, this pamphlet provides worthwhile data on U. S. tariffs on furs, economics of fur business in U. S., terms of the fur labeling act, numbers of furs of different kinds imported and exported in recent years, and on the nature and source of commercial furs, domestic and foreign.

Stains, Howard J., and Rollin H. Baker. FURBEARERS IN KANSAS: A GUIDE TO TRAPPING. U. Kans., Mus. Nat. Hist., Misc. Publ. no. 18: 1-100, 13 figs., 2 pl. Nov. 1958. 50¢, paper, postpaid.

"This bulletin presents information concerning the natural history of the various kinds of fur-bearing animals, where, how, and when to trap them, methods of preparing pelts for sale or personal use, suggested conservation practices that aid in keeping the seasonal crop of furbearers at a high level, pointers on buying fur, wearing apparel for the lady of the house, and the economic importance of these fur-bearing animals." An introductory section on reading sign includes an illustrated key to tracks. It should be interesting to test this key in the field. Also included, as an aid in reading sign, is a field key to the larger guard hairs. Both of these keys should, of course, be used with much caution, for their subjects are highly variable. Much of the booklet consists of species accounts in which natural history is reviewed in fair detail, methods of trapping and pelting are discussed, recipes for use of flesh are given, and management needs of the species are considered briefly. [It is most regrettable that both this booklet and that of Wilson, prepared at the cost of much time and effort, appeared just after the Conibear humane traps became generally available. Neither publication covers use of the Conibear trap, which will, we hope, displace the leg-hold trap.]

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) TRAPPING NORTH CAROLINA FURBEARERS. N. C. Wildl. Resources Comm., Fed. Aid Proj. W-6-R. 1-55 p., 33 figs. May 1958.

A detailed booklet that gives much information on equipment and methods for trapping with conventional steel traps and on care of pelts. Illustrations show tracks, sets, and handling of pelts.

BEARS

Anon. BRUIN IS PENNSYLVANIA'S BIG GAME PRIZE. Pa. Game News 29(11): 114, 1 photo. Nov. 1958.

Pa. has a 1-week bear season. The population seems to be holding up. Reported kill in 1956 was 335, about av. In 42 years, 17,992 legal bears have been taken. The largest weighed 633 lbs. before being dressed. Many weighed over 300 lbs., some over 400, a few about 500. Range of bear in Pa. has spread in recent years. A legal bear is one that is more than a year old.

Chambers, Bob. (W. Va. Cons. Comm.) THE BLACK AND WHITE OF THE BLACK BEAR. W. Va. Cons. 22(8): 28-30, 3 photos. Oct. 1958.
The take of black bears in W. Va. has declined steadily for 3 years and reached an all-time low in 1957. The bear should be given the status of game animal, and a system should be set up for paying for bear damage--which is mainly to sheep. Furthermore, research is needed on the bear population and factors affecting it. Some research needs are listed.

Harrison, George H. (Va. Comm. Game.) TRAPPING BEAR FACTS. Va. Wildl. 19(12): 10-13, 15 photos. Dec. 1958.
Photo-story tells how Va. catches black bears for research purposes. Modified steel traps are used, with drag, and with spring in chain. Trapped bears are shot with syringe-dart laden with nembutal. Mikedimide is later injected as an antidote. Penicillin is injected around syringe wound. All cuts are treated. Bear is measured, tagged, and plaster casts are made of teeth. Twenty-eight bears were taken in 2 counties in a short time; this may indicate presence of more bears than previously estimated, perhaps 1,100 in the state's 4,300 sq. mi. of bear range.

Kramer, Raymond J. (2686 S. Court, Palo Alto, Calif.) ADULT BROWN BEARS CLIMB TREES. J. Mamm. 39(4): 588. Nov. 1958.
Adult ♀ U. middendorffi climbed cottonwood on Kodiak Island. Author appeals for personal information on subject, as all publications deny that adult browns or grizzlies climb.

Murie, Olaus J. (Moose, Wyo.) THE LAST OF THE BIG BEARS. Aud. Mag. 60(4): 156-158, 188-189, 4 figs. July-Aug. 1958.
Grizzly bears in the U. S. now occur in but parts of 4 states. Colo. may have 20 in 2 wilderness areas. There are about 50 in n. Idaho. Mont. has some 440. Others are present in Glacier and Yellowstone parks and adjacent areas, but all told we have fewer than 1000. There may be a few left in Mexico. Murie discusses a number of vegetable foods he has known wild grizzlies to eat, and makes a plea for a civilized attitude that will make possible survival of the grizzly and the wilderness it requires. [A note on p. 188 states that Alberta has set aside an 8,000-sq. mi. tract in the n. part of the province as a reserve for grizzly and other bears.]

Stickley, Allen Raymond, Jr. THE STATUS AND CHARACTERISTICS OF THE BLACK BEAR IN VIRGINIA. M. S. thesis, Va. Poly. Inst. 1-102 p., 32 figs. June 1957.
Deals principally with range and population, cub growth, age determination, sexual dimorphism, reproductive capacity and characteristics, depredations, and aesthetic and economic values of the bear population in Va. The population was estimated to be approximately 1,102 bears that inhabit 4,296 sq. mi. of range. Although such factors as mast abundance and its location, and weather appear to affect the bear kill, the recent decline in kill appeared to indicate a population drop. Tooth-eruption data permitted development of a technique whereby cubs can be aged within 2 months of actual age during the period of tooth eruption. Skull-suture closure gave indications of being a reliable aging technique for adults. This technique was supplemented by tooth-wear characteristics and amount of rugosity on masseteric fossa of mandible. Sexual dimorphism often was not readily discernible. In adults it was demonstrated in greater body weight of males. Longer and wider skull and larger sagittal crest were also typical of males. Placental scars indicated an av. of 2.27 cubs per litter. Embryos showed no correlation between size and date. Male reproductive organs indicated that males were not in breeding condition in late Nov. and early Dec. Types of depredation and their importance were reviewed. Av. annual damage amounted to $2,300.--From auth. abst.

Youatt, W. G., and A. W. Erickson. (Mich. Dept. Cons., Shingleton.) NOTES ON HEMATOLOGY OF MICHIGAN BLACK BEARS. J. Mamm. 39(4): 588-589. Nov. 1958.
Tabular data on RBC, WBC, PCV, HGB, and sugar for 16 bears.

MUSTELIDS

Barbeau, Marius. (Natl. Mus. Canada, Ottawa.) PATHFINDERS IN THE NORTH PACIFIC. Caxton Printers, Caldwell, Idaho; Ryerson Press, Toronto, Ont. 235 p. 1958. $5.00. From review by Madge Wolfenden in The Beaver, Winter 1958.]

"Despite its title...the book is not really about the early explorers. It deals with the sea-otter (there are four chapters on this intriguing creature), with whaling and the hobbies of whalers; two chapters are devoted to narratives about the Klondike gold rush. The average, uncritical reader will no doubt be entertained with this curious variety of topics, but the discriminating reader and the student are sure to be distressed over its many inaccuracies of historic fact, the amateurish and unacademic footnotes, and the totally inadequate and inconsistent index."

Dew, Joyce. (Sask. Mus. Nat. Hist., Regina.) BADGER'S COLD STORAGE PLANT. Blue Jay 15(4): 177. Dec. 1957.

Two records of badgers killing chickens and burying them in sand, possibly for future use.

Eibl-Eibesfeldt, I. (Max-Planck-Inst., Buldern, Westfalen, Germany.) INNATE AND ACQUIRED TECHNIQUES IN KILLING OF PREY. (RESEARCH ON THE POLECAT, PUTORIUS PUTORIUS L.) Z. Säugetierk. 21(3/4): 135-137. 1956. [From German abstract by Müller-Using in Z. Jagdwissensch. 3(4).]

In German. Experience plays a large part in the development of specific killing techniques. Grown polecats that have never had living prey, when presented with living rats, will grab them in the most handy part so that the rat often turns and escapes. Polecats learn quickly by trial and error to grab the neck. Pursuit and killing of fleeing prey is innate. Polecats that were bitten at their first encounter with rats were temporarily afraid of rats.--V. F. Flyger.

Hamilton, W. J., Jr. (Cornell U., Ithaca, N. Y.) PAST AND PRESENT DISTRIBUTION OF MARTEN IN NEW YORK. J. Mamm. 39(4): 589-591, 1 map. Nov. 1958.

Known catch in N. Y. varied from 42 to 627, without apparent trend, in period 1920-35. Legal protection has been in force since 1936. Under protection, population apparently declined for a decade (until about 1946) and then increased. Today marten are fairly well distributed in the Adirondack area. Recent locality records are listed and mapped.

Hamilton, W. J., Jr., and David B. Cook. (Cornell U., Ithaca, N. Y.) A NOTE ON THE FISHER. J. For. 56(12): 913. Dec. 1958.

The fisher is still increasing and expanding its range in N. Y. Trapping in the season of 1957-58 took a record 428--86% over the former high of 230. This happened although pelt price was down to an av. of $16.

Jurgenson, P. B. AGE DETERMINATION IN PINE MARTEN. Zool. Zh. 35(5): 781-783. 1956. [From German abstract by Bubenik in Z. Jagdwissensch. 3(3).]

In Russian. Age of pine martens can be determined by skull characters such as tooth wear, extent of orbit constriction, and sutures. The following age classes can be determined: less than 1 year, 1 year 2 months, 2 years and 2 months, over 3 years, old animals, very old animals (up to 16-17 years). The paper contains a bibliography on age determination in carnivores.--V. F. Flyger.

Korschgen, Leroy J. (Mo. Cons. Comm., Columbia.) DECEMBER FOOD HABITS OF MINK IN MISSOURI. J. Mamm. 39(4): 521-527. Nov. 1958.

From summary: Based on 372 stomachs from all parts of Mo. Main foods, by volume percentages, were: frogs, 25; mice and rats, 24; fish, 20; rabbit, 10; crayfish, 9; birds, 6; fox squirrel, 2; muskrat, 1. Data suggest that mink are not seriously detrimental to other managed wildlife during winter. Good mink habitat apparently should include water and adjacent land from which vegetation is not overgrazed, burned, or cut. Such areas produce the foods most used by mink.

McCracken, Harold. HUNTERS OF THE STORMY SEA. Doubleday & Co., N. Y. 312 p. 1957. $4.50. [From review by J. W. Hedgpeth, Quart. Rev. Biol. 33(1).]
"This history of the sea otter trade in the North Pacific, more particularly of the Russian American Company, is based for the most part on standard sources. ...it is a reasonably straight-forward historical account, couched in swash-buckling prose." The sea otter is only the unwitting central actor in this violent history. "The treatment of the California episode is naive and loose... There is a brief index, but no formal bibliography. Sources are indicated in a series of terminal notes."

Scheffer, Victor B. (US F&WS, Sand Point Naval Air Sta., Seattle 15, Wash.) LONG LIFE OF A RIVER OTTER. J. Mamm. 39(4): 591. Nov. 1958.
14 years and 4 or 5 months. Notes are given on foods taken by this pet.

Stephens, Marie N. THE NATURAL HISTORY OF THE OTTER / A REPORT TO THE OTTER COMMITTEE. Universities Fed. for Animal Welfare, London, Eng. 88 p., 4 pl. 1957. 10s. 6d. [From review by Richard Morse, Nature, Sept. 27, 1958.]
The chief interest of this book on the otter in Britain lies "in Miss Stephens's intensive studies of this elusive animal in its natural haunts. The details she gives of its distribution and habits, its reproduction and breeding behaviour, its parasites and diseases, and above all its feeding habits, cover much fresh ground, and will throw new light on many an old belief regarding the otter's relationship to man and his needs."

Timofeev, V. V., and V. M. Hadeev. THE SABLE (Der Zobel). Izd. tech. i ekolog. literatury po voprosam zagotovak Moskva. 303 p. 1955. Price not stated. [From long German review by Bubenik in Z. Jagdwissensch. 3(4).]
Russian monograph on one of the world's finest fur animals. Contains accounts of the sable fur industry, biology, systematics, reproduction, food habits (mainly rodents), parasites, behavior, molt, skull characteristics useful in age determination, distribution and spread, management, and future of sable. The only natural enemy is the large e. Siberian marten. Bibliography of 426 titles.--V. F. Flyger.

Van Gelder, Richard George. A TAXONOMIC REVISION OF THE SPOTTED SKUNKS (GENUS SPILOGALE). Ph.D. thesis, U. Ill. 411 p. 1958. [From Dissertation Abstracts 19(5).]
Analyses of distribution, age, sex, color pattern, individual variation, probable pre-history, and evolutionary trends of the 2 species: Spilogale putorius (15 races) and S. pygmaea (monotypic). Size and color pattern are principal taxonomic differences.

DOGS, WOLVES, FOXES

Cutter, Wm. L. (U. Kans., Lawrence.) FOOD HABITS OF THE SWIFT FOX IN NORTHERN TEXAS. J. Mamm. 39(4): 527-532. Nov. 1958.
Vulpes velox is present in many parts of its range where once thought to be extinct. The 10 stomachs and 250 scats that are the basis of this paper were collected in Hansford Co., Texas, where most of the land is farmed or over-grazed. The foxes live in both cultivated and uncultivated fields, and apparently cause no trouble. Rabbits are an important food, but various rodents, small birds, and insects are also eaten frequently. Grasses appear in many scats and stomachs.

Grondahl, C. R. (N. Dak. Game Dept.) FOXES AND PHEASANTS. N. Dak. Outdoors 21(5): 4-5, 4 photos. Nov. 1958.
Do all pheasant remains around fox dens represent predation by foxes? To answer this question, 71 road-killed pheasants were accumulated in cold storage until foxes had young in dens. Then the carcasses were placed along ditches, field borders, etc. Forty-six bodies disappeared, 21 were eaten on the spot, 4 were left alone. Later all known fox dens were dug out or probed with barbed wire to recover remains with bands. Remains of 14 (about 20%) of the carcasses were recovered. Carcasses had been carried up to 1/2 mi. by foxes. Clearly foxes do gather up dead pheasants, and there are always dead pheasants to be found, owing to cars, farm machinery, flying into wires, etc.

DOGS, WOLVES, FOXES--Continued

Karpuleon, Fay. (Ladysmith High Sch., Ladysmith, Wis.) FOOD HABITS OF WISCONSIN FOXES. J. Mamm. 39(4): 591-593. Nov. 1958.

29 stomachs of red foxes collected in winter were studied and 25 mi. of fox trails were followed in snow. Cottontails, small mammals, and carrion were chief foods. In Rusk Co. where work was done, cottontails were near n. edge of range and were much scarcer than snowshoe hares. Yet snowshoe hares were not found to have been taken and cottontails were taken more heavily than found in studies made further s. where cottontails were commoner. No explanation is apparent, for red foxes eat hares elsewhere.

Siivonen, Lauri. (Unioninkatu 45 B, Helsinki.) HOW TO DISTINGUISH WOLF FROM DOG. Suomen Riista 12: 99, drawing. 1958.

In Finnish with English summary on separate mimeo. sheet. Identification on basis of size of carnassial teeth.

Vincent, Robert E. (Cornell U., Ithaca, N. Y.) OBSERVATIONS OF RED FOX BEHAVIOR. Ecology 39(4): 755-757. Oct. 1958.

Summary: "Behavior of thirteen wild red foxes was observed for two winters under near natural conditions in Alaska. Three forms of intraspecific combat were observed: violent, physical fighting; vociferous, modicum combat; and passive whining. Only when the highest animal of the social hierarchy was involved did the violent fighting occur. Most common was the noisy modicum combat in which the animals assumed the characteristic upright stance with their forepaws on the opponent's shoulders. Between foxes of opposite sex the passive whining was more frequent. A social hierarchical system was established biannually in November and February. Fighting is common during the first month of the formation of the social hierarchy. Time of arrival or presence for a second year appears to have little effect upon social order, while age, physical condition, temperament, and social rank of mate are important. The pairing behavior of two animals progressed from daily fights to tolerance for each other, to premating behavior by one individual, to premating antics by both, and finally to constant companionship."

CATS

Young, Stanley P. (US F&WS, Wash., D. C.) THE BOBCAT OF NORTH AMERICA / ITS HISTORY, LIFE HABITS, ECONOMIC STATUS AND CONTROL, WITH LIST OF CURRENTLY RECOGNIZED SUBSPECIES. Stackpole Co., Harrisburg, Pa., and Wildl. Mgt. Inst., Wash. 5, D. C. xi + 193 p., 29 pl., 10 figs., 2 graphs. 1958. $7.50.

Fourth and last of Young's monographs on natural history and control of major Am. predators. The other 3, on puma, wolf, and coyote, included taxonomic sections by coauthors. That was not feasible for this volume. Instead, synonymy and ranges of races are taken directly from the Miller & Kellogg checklist. Map of subspecific ranges appears much earlier, on p. 14. The rest of the book is an interesting mixture of personal observation, compilation, and anecdote. Chapter 1 is a brief account of bobcat in history and folklore. Chapter 2 takes up distribution, chiefly in Canada, and includes spot map. We would have appreciated data on present range in U. S. The book is somewhat contradictory as to the response of bobcats to civilization; absence or rarity over large areas is not mentioned. Chapter 3, pages 15-52, reviews size and weight, color, longevity, strength, swimming, tracks, travel, voice, captivity, enemies, sex ratio, development of young, den site, size of litters, hybridization, and family ties. It also includes digest of a technical study, by K. L. Duke, of reproduction as determined from 395 specimens. Chapter 4 brings together what is known of parasites and diseases, especially rabies. Chapter 5 is a long account of economic status as indicated by fur values and food habits. Much information is given on foods, and many deer kills are described. Bobcats eat a wide variety of animals, large and small, but rabbits are the staple. Chapter 6 discusses trapping methods in detail, demonstrates the fraud and futility of bounties, and tells a little about hunting with hounds. Chapter 7 is the list of subspecies. The book has a bibliography of 46 pages and an index. It has a large number of well diversified pictures, many of them attractive and interesting, but the numbering of plates and figures is so chaotic as to be meaningless.

BIG GAME, GENERAL

Aldous, M. C., and F. C. Craighead, Jr. (US F&WS, Desert Game Range, Las Vegas, Nev.) A MARKING TECHNIQUE FOR BIGHORN SHEEP. J. Wildl. Mgt. 22(4): 445-446, 1 photo. Oct. 1958.

The technique uses consecutively numbered horn brands that designate each individual, and brightly colored plastic streamers to facilitate field observations. Each streamer is put through a small slit in left ear and secured with a jess knot. Streamers of a given color are used for each trap.--M. C. Aldous.

Aldous, M. C., F. C. Craighead, Jr., and G. A. Devan. (US F&WS, Desert Game Range, Las Vegas, Nev.) SOME WEIGHTS AND MEASUREMENTS OF DESERT BIGHORN SHEEP (OVIS CANADENSIS NELSONI). J. Wildl. Mgt. 22(4): 444-445. Oct. 1958.

Weights and measurements of hunted and trapped desert bighorns are presented for herd comparisons and taxonomic differences.--Authors.

Banfield, A. W. F., and J. S. Tener. (Natl. Mus. Can., Ottawa.) A PRELIMINARY STUDY OF THE UNGAVA CARIBOU. J. Mamm. 39(4): 560-573. Nov. 1958.

Forms involved are currently assigned to Rangifer caboti and R. c. caribou. Aerial surveys and ground studies were made, 1954-56. Only 620 caribou were seen. Total population is estimated at 6,000. Distribution and probable sizes of present herds are discussed. Limited data all indicate very high production and survival relative to those of herds in nw. Canada. Much of the lichen range is luxuriant--perhaps best in world. But huge areas have been ruined by fires, especially along Gulf of St. Lawrence and e. shore of Hudson Bay. Hunting by natives is exterminative in intensity. The last herds in w. Ungava are being killed off. Significantly large herds remain in e. highlands only because natives have left George R. valley. Wolves are too rare to have much influence on caribou populations.

Boessneck, J. THE SIZE OF CENTRAL EUROPEAN ROE DEER IN ALLUVIAL-PREHISTORIC AND EARLY HISTORICAL TIME. Z. Säugetierk. 21(3/4): 121-131. 1956. [From German abstract by Müller-Using in Z. Jagdwissensch. 3(4).]

In German. Antlers of prehistoric and early historic Bavarian Capreolus were larger than those of today. Greatest decrease in antler size began in the Middle Ages. Size of wild boars and antlers of red deer also decreased. The author blames all this on exaggerated trophy hunting, especially in recent times.--V. F. Flyger.

Boone & Crockett Club, Committee on Records. RECORDS OF NORTH AMERICAN BIG GAME. Henry Holt & Co., 383 Madison Ave., N. Y. 17, N. Y. 264 p., illus. 1958. $10.00. [From review in Outdoor News Bul. 12(23).]

"...the latest in an irregularly published series of books on native big game species taken by sportsmen and rated under the Boone and Crockett Club's official scoring system. In addition to a brief summarization of the objectives of the scoring system, readers are provided scoring charts for big game trophies. Any shooter, with the assistance of the scoring chart, the accompanying instructions, and a tape, can measure his trophies and rate them against the championship heads. Black and white photographs of excellent quality depict typical champion and outstanding non-typical heads for all species of native big game. Tabulations give trophy measurements, championship rankings, owners, localities where the kills were made, and other data about the more than 2,500 animals recorded by the official judging committees. There are 14 new world's records in the revised lists. Helpful chapters are included on big game rifles, clothing, footgear, and other hunting equipment, and the care of trophies in the field and of mounted specimens."

Bungart, H. UNTERSUCHUNGEN AN SCHILDDRÜSEN VON HIRSCHEN AUS FREIER WILDBAHN. Frankfurter Z. Pathol. 67(1): 13-27. 1955. [From short German abstract by Mendheim in Z. Jagdwissensch. 3(4).]

Considers seasonal, sexual, and age differences in weight and activity of thyroid glands of red deer.

Cole, Glen F., and Bruce T. Wilkins. THE PRONGHORN ANTELOPE / ITS RANGE USE AND FOOD HABITS IN CENTRAL MONTANA WITH SPECIAL REFERENCE TO WHEAT. Mont. Fish & Game Dept., Tech. Bul. no. 2: 1-39, 5 figs. July 1958.

A 2-year study was made where rangeland adjoined cropland and depredation on wheat was reported. Pronghorns used rangeland more than cropland at all seasons. They seldom went more than 1/2 mi. into cropland. As to food, browse was 62%, forbs 20%, waste grain 10%, sprouted grain 6%, and grass 3%. All sex and age classes used grain fields. Use was mainly by groups of animals. (Influence of ♂ behavior on social structure of groups is discussed.) Some marked animals made seasonal travels of 10-23 mi. Intensity of use of cropland varied with season and weather. "Changes in wheat yields due to treatments involving antelope use plus ground level clipping on May 1 or antelope use alone could not be demonstrated. Ground level clipping on May 19 when culms were elongating reduced yields. The critical period for affecting wheat yields by grazing was ...about May 15 until harvest time (July or August). Antelope commonly bedded on grain fields, but the seeded portions of fields were avoided during the period when their vision would have been obstructed by standing grain. Trampling effects were only apparent on single trails which crossed two fields. The soil disturbance and trampling which resulted from cattle grazing appeared to be much greater than that which resulted from antelope using grain fields."

Dasmann, Wm. P. BIG GAME OF CALIFORNIA. Calif. Dept. Fish & Game. 1-56 p., illus. 1958. 25¢.

Good pocket-size, educational booklet of some reference value. It gives range maps (to subspecies) and illustrations of nearly all species of big game animals in Calif. Text discusses identification, history, habits, present status, and management for each species except whitetail deer, which is very rare in Calif. This booklet should be a good, quick source of information even for technical men, especially for its data on distribution and numbers of such animals as the tule elk and puma.

Harris, John T. ANALYSIS OF ELK WINTER RANGE, SOUTH FORK OF THE WHITE RIVER, COLORADO. M. S. thesis, Colo. State U. 136 p., 24 tables, 2 figs., illus. Jan. 1958.--L. E. Yeager.

Hawthorn, J., and R. B. Duckworth. (Roy. Coll. Sci., Glasgow, W.2, Scot.) FALL-OUT RADIOACTIVITY IN A DEER'S ANTLERS. Nature 182(4645): 1294, 1 fig. Nov. 8, 1958.

Krüning, F., and F. Vorreyer. (Hebenshausen bei Witzenhausen, Ger.) STUDIES OF REPRODUCTIVE RATES AND BODY WEIGHTS OF FEMALE RED DEER. Z. Jagdwissensch. 3(4): 145-153. 1957.

In German with English summary. In Austria and Germany, av. weights of ♀ red deer decrease from n. to s. and from e. to w. Av. weight varies from 64 kg. in 1 region to 44 kg. in another. Percentage of pregnancy in 19- to 20-month ♀♀ also decreases from n. to s. and e. to w. The percentage of pregnant ♀♀ in this age class varies from 74 to 17, according to geographic regions.--V. F. Flyger.

Lojda, Zd. HISTOGENESIS OF ANTLERS OF OUR CERVIDS AND THEIR HISTOCHEMICAL STRUCTURE. Čs. Morfologie 4(1): 43-62, 24 photomicrographs. 1956. [From long German abstract by Bubenik in Z. Jagdwissensch. 3(4).]

In Czech with English summary. Cervids studied were red, roe, and fallow deer. Bubenik's review gives some of the findings.

Lubinsky, G. (Inst. Parasit., McGill U., Macdonald Coll. P. O., Quebec.) OPHRYOSCOLECIDAE (CILIATA: ENTODINIOMORPHIDA) OF REINDEER (RANGIFER TARANDUS L.) FROM THE CANADIAN ARCTIC. I. ENTODINIINAE. Can. J. Zool. 36(5): 819-835, 33 figs. Oct. 1958.

This paper, the first of a series recording findings from the rumen contents of 14 reindeer from the Canadian Arctic, redescribes 10 species of Entodinium. A key to the species of Entodinium of reindeer has been compiled.--Auth. abst.

McHugh, Tom. (Jackson Hole Biol. Res. Sta., Moran, Wyo.) SOCIAL BEHAVIOR OF THE AMERICAN BUFFALO (BISON BISON BISON). Zoologica 43(1): 1-40, illus. 1958. [From Biol. Abst. 32(12).]

Behavior was studied in free-ranging and fenced herds in several reserves. Observations are reported on feeding, vocal expression, senses, play, locomotion, systems of trails, and other activities. The leader of a moving herd was usually a cow, but there was no exclusive leader. No leader was apparent in some types of travel. Groups were classified into "bull groups," which contained mature males with an infrequent female, and "cow groups," which contained a majority of females and a smaller number of males, mostly younger bulls. During rut, many cow groups coalesced and were joined by bull groups. Observation of interactions between individuals revealed a linear type of dominance hierarchy with dominant individuals exercising a virtual constancy of success. Such interactions were classified into "passive dominances" (72.8%) and "aggressions" (27.2%). Permanent changes in hierarchy resulted from differential growth of bulls and cows. Dominance among calves developed slowly, with first definite signs noted at 4 months. Interspecific dominance hierarchy was: adult human beings > buffalo > elk > mule deer > pronghorn > moose or whitetail deer. The rut was delineated by a marked increase or by an onset of several specific activities among bulls. The rutting bond between bull and cow was called a "tending bond" and resulted in a temporary monogamous mateship. Bulls bellowed frequently during the rut, interpreted as typically a display of threat. Wallowing by bulls was attributed to tension between bulls rather than to irritation from insects. It was thus considered a "displacement activity." Bulls circulated freely among rutting herds. Most cows were sexually mature at 2 years and calved at 3, although a very few calved at 2. Incidence of pregnancy declined gradually after 12 years. Cows gave birth to calves when isolated from cow groups or when with them. The influence of buffalo on surrounding mammals, birds and vegetation is discussed.--From auth. abst.

Moisan, Gaston. (Dept. Chasse et Pêche, Quebec, Can.) LE CARIBOU DE GASPÉ. I. HISTOIRE ET DISTRIBUTION. II. [No part title listed by Biol. Abst.] III. ANALYSE DE LA POPULATION ET PLAN D'AMÉNAGEMENT. Naturaliste Canadien 83(10) p. 225-234, illus., map, 1956; 83(11/12) p. 262-274, illus., map, 1956; 84(1) p. 5-28, illus., 1957. [From Biol. Abst. 32(12).]

This article of about 44 pages should be a significant contribution. Part I deals with history and distribution. Contents of part II are not stated. As to part III, Biol. Abst. says, "Structure of population, period of mating and behavior, physical condition, mortality causes, interspecific competition, and management of Gaspé caribou are discussed."

Moody, Paul A. (U. Vermont, Burlington.) SEROLOGICAL EVIDENCE ON THE RELATIONSHIPS OF THE MUSK OX. J. Mamm. 39(4): 554-559, 1 graph. Nov. 1958.

Tests all agreed in showing that musk ox is closely related to the goat-sheep group, and not closely related to the bison-cattle group. This finding should end an old controversy.

Moore, Tom D. (Texas Game Comm.) IMMIGRANT ON TRIAL. Texas Game & Fish 16(9): 16-19, 10 photos. Sept. 1958.

Bighorns are dying out in Texas, but efforts are being made to propagate them in the Black Gap Mgt. Area in Brewster Co. Stock is obtained from the Kofa Game Range in Ariz. This article tells how the bighorns are trapped at waterholes, how they are treated and transported, and how high the death rate is despite use of tranquilizers, antibiotics, and special handling. A few notes are also given on habits and foods in the Black Gap area.

Nichols, Lyman, Jr. FORAGE UTILIZATION BY ELK AND DOMESTIC SHEEP IN THE WHITE RIVER NATIONAL FOREST. M. S. thesis, Colo. State U. 92 p., 11 tables, illus. Feb. 1957.--L. E. Yeager.

Page, F. J. Taylor. FIELD GUIDE TO BRITISH DEER. Mammal Soc. of Brit. Isles (c/o Univ., Birmingham), Field Guide to British Mammals, no. 1. 80 p., illus. 1957. 10s. 6d. net. [From review by Richard Morge, Nature, Sept. 27, 1958.]

"It deals chiefly with the five species most commonly found at large in Great Britain, but contains notes also on other species, such as the Chinese waterdeer, which may be seen in very limited areas." The guide "is a model of clarity and compactness. In its mere eighty pages it contains a wealth of observations, tables and sketches that one is unlikely to find in any other British book, all carefully compiled and set out to help one to ascertain which deer are present in any particular region, and to identify them when seen. Distribution, habitat, gait, tracks, droppings, seasonal behaviour, daily activities, voice, antlers, food and so on are all dealt with in a way that makes this attractive little book in green and gold a pleasure to consult."

Riney, Thane. (Box 240, Bulawayo, S. Rhodesia.) INFLUENCE OF LAND USE ON LARGE-MAMMAL PROBLEMS IN NEW ZEALAND. N. Z. Sci. Rev. 16(3/4): 33-35. Mar.-Apr. 1958.

This essay points out that wildlife problems of N. Z. are seldom simple enough to be solved by just reducing big-game populations, or by other narrow approaches. Circumstances vary with the environment. Different parts of the same watershed often present entirely different situations. So do different species of animals. One must consider the range-use characteristics of each form of big game as well as each form of livestock. The total environment (ecosystem) of a site, and of the neighboring sites, must be considered in deciding what is needed. It is extremely important to take into consideration the present, proper, and future land use that man will make of a given site. This is essential not only in planning management, but in formulating research problems--in asking the right questions.

Sainio, Pekka. CONCLUSIONS ON THE MOOSE PROBLEM. Suomen Riista 12: 63-69, 7 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. Recommendations for reduction of damage to pine seedling stands by moose include: (1) establishing "moose pastures" managed for mountain ash, willow, birch, and juniper on sites of secondary forestry value, such as power line cuts, swamps, lake shores, rocky areas, and narrow stream hollows, and located also as far as possible from the pine areas; taking special measures such as felling aspen trees or providing artificial feeding to help direct moose to pasture areas; (2) making the pine areas unattractive to moose by raising the pines clean and thinned from the beginning as an even-aged pure stand, and by making the plantings over large areas.

Shaw, Wesley. (Idaho Game Dept.) STATUS AND HUNTING OF MOUNTAIN GOATS IN IDAHO. Idaho Wildl. Rev. 11(3): 10-12, 1 photo. Nov.-Dec. 1958.

Semipopular paper that discusses abundance and distribution, reviews natural history, and provides data on recent kills and costs of mtn. goat hunts. Idaho now has about 2,800 mtn. goats. About 40% are in the Salmon R. watershed, and about 30% in the Clearwater watershed. Herds usually are small. Seasonal, altitudinal migrations are extensive. Only twice in past 30 years has hunter kill exceeded 100 goats. Only 1,222 are known to have been shot since 1927. Success on the controlled hunts is high: from 42% to 100% since 1952. Few permits are issued in a year, from 5 to 65. Most goats shot are mature. Sex ratio of goats bagged is 47 ♂♂ to 53 ♀♀; hunters cannot be expected to distinguish the sexes of this species.

Skoog, Ronald O. RANGE, MOVEMENTS, POPULATION, AND FOOD HABITS OF THE STEESE-FORTYMILE CARIBOU HERD. M. S. thesis, U. Alaska. xii + 145 p., 29 figs. May 1956. [Copy in US Dept. Int. Library.]

Szederjei, A. (Hungary, Budapest II, Kunfi Zsigmond-U 44.) BARK PEELING BY RED DEER. Z. Jagdwissensch. 3(3): 101-107. 1957.
In German with English summary. The amount of damage to various species differs greatly by districts although ash, poplar and linden are preferred. Worst bark gnawers are old ♀♀; old ♂♂ gnaw the least. Deer do not leave their home ranges to gnaw bark. Bark seems to contain no necessary food stuffs and gnawing could not be prevented by supplying food and minerals. Numerous instances are cited to show that the more easily food is acquired, the greater the amount of bark peeling by red deer. Hungry deer do not bother to peel bark. Transplanting habitual gnawers to non-gnawing populations will set the whole population to gnawing. Best repellents tested were odors of large carnivores. --V. F. Flyger.

Vibe, Chr. THE MUSK OX IN EAST GREENLAND. Mammalia 22(1): 168-174, pl. 7. Mar. 1958. [From J. Mamm. 38(4).]

Yli-Vakkuri, Paavo. MOOSE DAMAGE IN SEEDLING STANDS OF PINE IN OSTROBOTHNIA. Silva Fennica 88: 1-17. 1956. [From Biol. Abst. 32(11).]
In Finnish with English summary. Deals with damage caused by Alces alces in young pine stands established by direct seeding as revealed by examination of 110 sample plots established between 1930 and 1944. Signs of moose damage were observed in 20% of stands. In more than half of damaged stands, pine seedlings had been damaged; in the rest damage had occurred only to hardwood saplings. Moose damage is less general in pure pine stands than in stands with some hardwood, especially willow, mountain ash, and aspen, and to some degree birch. All factors that improve living conditions of hardwoods, e.g. good soil and swampiness, tend to increase a stand's liability to moose damage. With the present moose stock, however, the damage is insignificant in development of pine seedling stands.--From auth. summ.

DEER (Odocoileus)

Allen, Durward L. (Purdue U., Lafayette, Ind.) HOW OUR GAME LAWS WASTE DEER. Field & Stream 63(6): 51-53, 104-106, 108, illus. Oct. 1958.
Forceful, popular article based on research in several states. Dr. Allen shows how great the kill is of illegal deer--how large a proportion of our herds is being shot and left to feed the scavengers. The only cure is realistic regulations, flexible regulations, that allow game departments to adjust size and nature of the kill to the circumstances of the local population.

Bowers, Glen L. (Pa. Game Comm.) THE PENNSYLVANIA DEER STORY--1958. Pa. Game News 29(10): 33-48, 3 maps, sketches. Oct. 1958.
Tells about the history and present condition of deer in Pa., explains why antlerless deer are hunted on a county-quota basis, and answers many common questions about deer matters. It includes simple tables showing av. weights, percentage of spike bucks shot, estimated sex-age composition and total size of state's herd, breeding season, sex-age composition of the kill, nonhunting mortality, antlerless quota for each county, and kill of antlerless and/or antlered deer in Pa. each year since 1915.

Bowes, Anne LaBastille. ECOLOGICAL ANALYSIS OF MULE DEER WINTER RANGE, CACHE LA POUDRE CANYON, COLORADO. M. S. thesis, Colo. State U. 189 p., 19 tables, 9 figs., illus. May 1958.--L. E. Yeager.

Cook, Robert S. (Wis. Cons. Dept., Ladysmith.) DEER EXCLOSURES TELL A STORY. Wis. Cons. Bul. 23(11): 15-17, 7 photos. Nov. 1958.
Pine plantations were ruined and food supply for deer was drastically reduced by deer browsing. The striking contrast inside and outside exclosures is shown in 6 photos.--L. F. Stickel.

DeBoer, Stanley G. (Wis. Cons. Dept., Black River Falls.) LESS WASTE IN THE WOODS. Wis. Cons. Bul. 23(10): 13-17. Oct. 1958.

Wis. found that the 1956 deer season in heavily hunted e. Jackson Co. left 2 illegally killed deer in the woods for every legal deer taken out (see WR 90 p. 47). For 1957, regulations were changed to allow each party of 4 hunters to take a deer of any sex or age in addition to the regular bucks. Surveys were run after the season to see what the effects were. It was found that instead of 3.5 legal deer per sq. mi. being taken out and 6.5 left wasted, there were 9 legal deer taken out and only 4 deer illegally killed and left. Calculated total kills were 4,725 in 1956 and 6,179 in 1957. Carry-over in 1957 was entirely adequate. Portion of "herd drain" removed legally was 36% in 1956 and 69% in 1957. In another area of the state, where both deer density and hunting pressure were lower, illegal kill and waste were only about half as serious as in e. Jackson Co. "For years it has been observed that there seemed to be a direct relation between deer and hunter numbers and the level of illegal hunting." Study was also made of crippling loss on Necedah Refuge, where only bow hunting is permitted and deer take was 900 in 1957. Crippling loss apparently represented only about 10% of total "herd drain," which is lower than reported for many gun-hunted areas.

Diem, Kenneth L. (U. Wyo., Laramie.) FERTILE ANTLERED MULE DEER DOE. J. Wildl. Mgt. 22(4): 449. Oct. 1958.

Observations of an antlered ♀ mule deer during 3 breeding seasons indicated that fawns were produced annually without shedding of the velvet covered antlers.--Author.

Dietz, Donald R. SEASONAL VARIATION IN THE NUTRITIVE CONTENT OF FIVE SOUTHWESTERN COLORADO DEER BROWSE SPECIES. M. S. thesis, Colo. State U. 110 p., 22 tables, 12 figs., illus. July 1958.--L. E. Yeager.

Duncan, Don A., and E. A. Epps, Jr. (S. For. Exp. Sta., New Orleans 13, La.) MINOR MINERALS AND OTHER NUTRIENTS IN LOUISIANA RANGE FORAGE. J. Range Mgt. 11(5): 247-248. Sept. 1958.

All minor minerals were present in adequate amounts. So were potassium and calcium. Only phosphorus and crude protein were too scarce and needed to be supplied by artificial supplements, which, for cattle, were in the form of cottonseed cake and bonemeal.

Flyger, V. F. (Box 1510, Annapolis, Md.) TOOTH IMPRESSIONS AS AN AID IN THE DETERMINATION OF AGE IN DEER. J. Wildl. Mgt. 22(4): 442-443, 3 figs. Oct. 1958.

Summary: "A method was developed for making impressions of the lower teeth of deer. Plaster casts of these impressions are replicas of the deer teeth. This method makes possible the use, in widely scattered localities, of untrained personnel, who can collect data and send it to a central office where one man determines the age of all the deer."

McGinnes, Burd S., and John H. Reeves, Jr. (Va. Poly. Inst., Blacksburg.) COMPARE INDIAN-KILLED DEER WITH MODERN DEER. Va. Wildl. 19(12): 8-9, 2 figs. Dec. 1958.

Authors ascertained age of 19 deer represented by jaws in collections of precolonial Indian material from Va. Thirty-seven percent of the jaws were from deer 5 years old or older. In general, early age groups were underrepresented, by today's standards, and later groups, to 7 years, were overrepresented. If the small sample is reliable, this suggests that the herd was not thrifty and growing. Probably it was not hunted heavily enough to keep it highly productive. Also, the range probably was unfavorable, with too much mature timber and too little available food.

Schofield, R. D. (Mich. Dept. Cons.) WASTE IN THE WOODS. Mich. Cons. 27 (6): 22-24, 2 photos. Nov.-Dec. 1958.

The problem of how many deer are shot and left in the woods has been studied in Mich. for 30 years. Estimates have run from about 1/4 of the legal buck kill to slightly more than the legal buck kill. The general conclusion is that about half as many deer are wasted as are taken out. Legalized shooting of fawns, does, and short-antlered bucks will alleviate the situation, insofar as it is permitted.

Speaker, Everett B., and Paul D. Kline. (Iowa Cons. Comm.) IOWANS HARVEST 2,813 DEER DURING 1957. Iowa Cons. 17(4): 25, 29. 1958. [From Biol. Abst. 32(10).]

In a 31-day season, 1,226 bow hunters killed 138 deer, compared to 2,187 deer shot by 6,000 gun hunters in a 2-day season. Bow hunters hunted 370 hours/deer killed; gun hunters, 31.1 hours. Males comprised 54.5% of the kill. Fawns comprised 40.8%; only 1% were over 4.5 years old. The kill indicates that at least 69 fawns were produced per 100 adult deer in 1957. Male deer averaged 98, 154, 192, 195, and 205 pounds at 0.5, 1.5, 2.5, 3.5 and 4.5 years respectively. Females averaged 95, 135, 153, 155, and 159 pounds.--K. D. Carlander.

Stenlund, Milton. (Minn. Dept. Cons., Grand Rapids.) A HISTORY OF ITASCA CO. DEER. Cons. Volunteer 21(125): 19-24. Sept.-Oct. 1958.

The forests of Itasca Co., Minn. are growing out of the reach of deer. Starvation has occurred in some recent winters, but the condition of the herd is still relatively good, thanks in part to any-deer hunting. The kill is too low, about 18.5% of population, while reproduction is about 25-45%. Aside from increasing hunting pressure, the best course is continuation of small, scattered timber sales. Intensive management of deer yards is too expensive for general use, but can be applied to certain important areas. The paper gives data on populations, hunting pressure, and sex and age groups in recent kills. It also mentions faunal changes that are accompanying growth of forest and larger proportions of conifers: In the border counties, fisher, lynx, and moose are increasing; pine marten is again reported; spruce grouse are as common as ruffed grouse in some areas; bobcats, coyotes, and red foxes are finding the habitat less suitable.

Swank, Wendell G. (Ariz. Game Dept.) THE MULE DEER IN ARIZONA CHAPARRAL / AND AN ANALYSIS OF OTHER IMPORTANT DEER HERDS. Ariz. Game & Fish Dept., Wildl. Bul. no. 3. vii + 109 p., 37 figs. + drawings. Feb. 1958. Second printing, Sept. 1958.

This printing is to some extent a revision, as several changes or corrections were made, especially in chapters 9 and 10. For serious research work, therefore, the second printing is preferable. See WR 91 p. 71 for review of 1st printing.

MAMMALS--MARINE

Bergman, Göran. THE SEAL POPULATION IN FINLAND. Suomen Riista 12: 110-124, 6 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. Populations of bristled seal [Erignathus?] were high in middle 1930's but declined drastically in face of overhunting and warm winters that reduced ice floes so that rearing areas were inadequate. Populations increased in 1950's but still were low. Grey seal [Halichoerus] also declined, but less seriously, and still exists along most of the coastline. In certain areas there is a disproportionately large number of very old individuals because of an extremely heavy catch of young seals.

Chittleborough, R. G. (C.S.I.R.O., Cronulla, New South Wales.) THE BREEDING CYCLE OF THE FEMALE HUMPBACK WHALE, MEGAPTERA NODOSA (BONNATERRE). Australian J. Marine and Freshwater Res. 9(1): 1-18, illus. 1958. [From Biol. Abst. 32 (12).]

See good author's abstract in Biol. Abst. 32(12).

MAMMALS--MARINE--Continued

Creisler, Joe. (Del Norte Co., Calif., Health Dept.) THE DISPOSAL OF DEAD MARINE MAMMALS. Calif. Vector Views 5(10): 65-67, 4 photos. Oct. 1958.
Coastal areas have a sanitary and economic problem in disposing of large dead animals on the beach. Blasting has been found quickest and most sanitary. A carcass that is blown to shreds is soon carried away by tides and eaten by birds. The primary aim is to blow the shredded carcass into the water, on an incoming tide if possible. Techniques are described and costs are stated.

Davies, J. L. (U. Tasmania, Hobart.) THE PINNIPEDIA: AN ESSAY IN ZOO-GEOGRAPHY. Geog. Rev. 48(4): 474-493, 10 maps. Oct. 1958.
A serious effort to interpret the geographic history of the seals and their relatives. "The present study attempts to use evidence from as many fields as possible, and, although it lacks the firm basis of paleontological data that would be desirable, it does seem to provide the only theory of pinniped origin and spread that is fully tenable in the light of the facts as they are known at present. The evidence of existing distribution is summarized on a series of maps that, together with a series published previously [Ecology 39: 97-113], represent an attempt to map the distribution of all pinniped forms." Sections of the paper are: A working hypothesis, Origin of the Pinnipedia, Geomorphic barriers and avenues, Climatic barriers and avenues, Family beginnings, The sea lions (Otariidae), The walruses (Odobenidae), The seals (Phocidae), The northern seals (Phocinae), The monk seals (Monachinae), The Antarctic seals (Lobodontinae), The bladdernosed seals (Cystophorinae), Rates of evolution, and Regional geography of the pinnipeds.

Lockley, R. M. SEAL MARKING, 1957. Nature in Wales 4: 537-543. 1958. [From J. Animal Ecol. 27(2).]
160 gray seals were ringed in 1957. Three seals born on Ramsey Is. were found on coast of Brittany. Speed of travel, winter distribution of young, and other matters are discussed.

McLaren, I. A. (Fish. Res. Bd. Can., Montreal.) SOME ASPECTS OF GROWTH AND REPRODUCTION OF THE BEARDED SEAL ERIGNATHUS BARBATUS (ERXLEBEN). J. Fish. Res. Bd. Can. 15(2): 219-227. 1958. [From Biol. Abst. 32(12).]
See abstract in Biol. Abst. 32(12).

Sergeant, David E. (Fish. Res. Bd. Can., 505 Pine Ave. W., Montreal 18, Quebec.) DOLPHINS IN NEWFOUNDLAND WATERS. Can. Field-Nat. 72(4): 156-159, 2 photos. Oct.-Dec. 1958.

MAMMALS--OTHER GROUPS

Buchanan, G. D. (Houston State Teach. Coll., Huntsville, Texas.) THE CURRENT RANGE OF THE ARMADILLO DASYPUS NOVEMCINCTUS MEXICANUS IN THE UNITED STATES. Texas J. Sci. 10(3): 349-351. Sept. 1958.
"In spite of prolonged drought conditions in parts of its range, the armadillo has maintained essentially steady population area. Armadillos occur in most of Texas (except the trans-Pecos and panhandle areas), the southern portion of Oklahoma and Arkansas, essentially all of Louisiana and southwestern Mississippi. Separate populations of armadillos are found in southeastern Alabama and most of Florida except the southernmost and western areas. Most notable range increase is in Florida where the animals have increased their range by about fifty per cent in the past four years." The range statement given here is based on existence of populations, not isolated records or former populations.

BIRDS--GENERAL

Cruickshank, Allan, and Helen Cruickshank. 1001 QUESTIONS ABOUT BIRDS. Dodd, Mead & Co., N. Y. 320 p., illus. 1958. $5.00. [From review by Amy Clampitt, Aud. Mag. 60(6).]

That the authors "know how to phrase answers that are crisp and explicit, while avoiding misleading oversimplifications, they abundantly prove in a book which it is a joy to recommend." People who have to answer nature questions will find the book indispensable. "Especially admirable are the clear and knowing expositions of such matters as the speed, altitude, and mechanics of flight, and of that enormous jigsaw puzzle of unmatched hypotheses, migration." Some of the other topics are: names and classification; forms and uses of bills, feet, tails, skin, and feathers; senses; courtship; eggs and nests; ranges and habitats; songs; banding; folklore and history; numbers and sizes. One chapter is devoted to conservation; the authors pull no punches. "'A boy with a BB gun' they bracingly remind us, 'does not begin to do the damage to wildlife that a well-meaning but short-sighted and unwise civic program of marsh drainage may do.'"

Gilliard, E. Thomas. LIVING BIRDS OF THE WORLD. Doubleday & Co., Garden City, N. Y. 400 p., 396 photos, 217 of them on 112 pl. in color. 1958. $12.50. [From reviews by Wm. G. Conway, Animal Kingdom 61(6), and Howard Zahniser, Nat. Mag. 52(1).]

"...a remarkably readable and comprehensive review of the avian world backed up by a spectacular group of fine photographs. It is not merely a picture book, but contains more than 200,000 words of fascinating text summarizing an amazing amount of up-to-date life history and structural information. The American naturalist can read how a Barn Owl may capture prey in complete darkness and how Oil Birds find their way in South American caves, or he may compare the surprising habits of our native Cowbirds with the wonderful parasitic practices of European Cuckoos. Elephant Bird eggs and 'Thermometer Birds,' Puffin life and Tody nests, Hornbills and Jacamars, Honey-guides and Manakins--all are reviewed with discernment, so that exciting features are brought to light. A few errors in a work of this scope are inevitable, and there are some mistakes in the text and a misidentification or two among the pictures... The beautifully reproduced...photographs are a major contribution. Certainly several species have rarely, if ever, been illustrated before, and while many of the photos are of captive specimens, Dr. Gilliard has selected many pictures which are calculated to show something of the bird's life or habits. This book is likely to be the 'standard work' for some time to come..." Most of the photos show birds "in the wild at their nests and in their wild activities..." The volume is 8-5/8 x 11-3/8 in. in size and has index and bibliography.

Heinroth, Oskar, and Katharina Heinroth. THE BIRDS. Transl. by Michael Cullen from 2d ed., 1955, of Aus dem Leben der Vögel. U. Mich. Press, Ann Arbor, and Ambassador Books, Ltd., Toronto. 1-181 p., 91 figs. 1958. $5.00.

Heinroth was a pioneer in the study of living animals, a leader in the Eur. school of animal behavior. THE BIRDS is an informative, popular little book on avian behavior and biology. It is easy, interesting reading, yet it contains much of real value. Presentation is concise, often anecdotal. The book is well designed for amateurs, but professionals will learn from it. It is up-to-date, yet surprisingly simple, in respect to such matters as orientation. Translation is good, generally pleasing. Our only complaints with the book concern its price and lack of references. Some of the 22 chapters take up: nesting, recognition of own eggs and young, relation of size of bird to size of egg, cuckoos, hybrids and intersexes, mating and pairing, eggs and young, color and pigment, keeping clean, communication, senses, and mentality.

INTERNATIONAL COMMITTEE FOR BIRD PRESERVATION. BRITISH SECTION. ANNUAL REPORT FOR 1957. 1-47 p. + 4 pl. [1958.] 3s. from the Committee, c/o Brit. Mus., Cromwell Rd., London S.W. 7.

The tenth world conference was held in Southern Rhodesia. Principal items on the agenda included status and protection of birds of prey, status of the white stork and plans for a census of its numbers in 1958, effects of pesticides on wildlife, and problems of damage and nuisance by birds. In Africa, the red-billed weaver has made a serious problem by damaging crops. Experiments with lethal control, including spraying colonies with parathion at night from air-

craft, had little effect. Swifts have been a nuisance at refineries, which are brightly lit at night, and also at military towers. They were kept from the latter by a rotating radar unit with a strong beam. One section of the paper is on oil pollution of the oceans. Resolutions concerning U. S. included: (1) a recommendation for a closed season on all white geese in the California area that is the sole wintering ground for Ross's goose, (2) a recommendation that whooping cranes be secured and reared in captivity, and (3) a commendation on efforts made on behalf of the Laysan teal.--L. F. Stickel.

Korschgen, Leroy J. (Mo. Cons. Comm.) AVAILABILITY OF FALL GAME BIRD FOOD IN MISSOURI TOPSOIL. Mo. Cons. Comm., P-R Series no. 16. ii + 36 p. Oct. 1958.

632 samples were taken from 6 widely separated parts of Mo. Samples were 1 ft. sq. and consisted of litter and soil to depth of 1/2 in. Eight field types were represented; they varied in soil type from best to poorest. Seeds were identified and quantities were determined. Seeds were classed as select (commonly eaten) or non-select (seldom or not eaten). In the 2 years of study, n. Mo. produced av. of 102 lbs. of select and 37 lbs. of non-select seeds per acre. At same time, s. Mo. samples av. 55 lbs. select and 52 lbs. non-select seeds per acre. Drought seriously affected seed production. "...cornfields, pastures, and soy-bean fields were the heaviest producers of game bird foods in northern Missouri, with 135, 135, and 125 pounds per acre, respectively. Pastures, fallow-waste areas, and small grain fields produced greatest amounts in southern Missouri, with 102, 86, and 63 pounds per acre, respectively." Production of select foods varied from 0.4 to 311 lbs. per acre. Some foods classed as select may have been so classed because of high availability, but some seeds of high availability were not much used by game birds. Eighteen tables fully present results of the project.

Schüz, E. (Staatl. Mus. Naturkunde, Stuttgart, Ger.) METHODS OF CAPTURING AND HUNTING BIRDS IN THE SOUTHERN CASPIAN REGION. Z. Jagdwissensch. 3(3): 107-114. 1957.

In German with English summary. Interesting account of some strange methods for collecting birds using nets, snares, falcons, sticks, and other techniques. Geese were captured by men approaching with only their heads above water. The men's heads were covered with hollow pumpkins with cut-out observation holes. Geese were also captured in underwater nets. Some of the methods described seem far-fetched.--V. F. Flyger.

Sharp, Ward M. (Pa. State U., U. Park.) MICROCLIMATIC INFLUENCES CREATED BY GROUND NESTING BIRDS. Ecology 39(4): 757, 1 photo. Oct. 1958.

When birds nest on the ground in open areas early in spring, warmth of body may cause vegetation immediately around nest to grow taller and faster. The result is cover and windbreak. The phenomenon was observed specifically in willet and pintail. Birds tend to increase the cover effect by training vegetation to arch over nest. The Canada goose, however, "either prefers no protective cover about the nest, or fidgeting during incubation causes the incubating bird to pluck all cover within reaching distance."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Beer, James R. (U. Minn., St. Paul 1.) THE COMPOSITION OF BIRD FLOCKS. Flicker 30(3): 78-83. Sept. 1958.

A discussion of types of aggregations and possible reasons for them in different species.

Curry-Lindahl, Kai. (Nordiska Museet & Skansen, Stockholm.) INTERNAL TIMER AND SPRING MIGRATION IN AN EQUATORIAL MIGRANT, THE YELLOW WAGTAIL (MOTACILLA FLAVA). Arkiv för Zoologi (Stockholm), Ser. 2, 11(33): 541-557. Oct. 1958.

From summary: "The different patterns of physiological rhythms in various races of M. flava living together under natural conditions on their wintering areas in tropical Africa with almost constant length of daylight, demonstrated that the internal timer works independently of external factors produced by the environment in the equatorial winter quarters. It may be that different

light intensities during dry and rainy seasons in equatorial Africa influence the annual, physiological cycle of M. flava, but with regard to the great local variability of light intensity in various parts of tropical Africa around the equator it does not seem to be a determining factor inducing physiological phenomena in connection with migration. The internal cycle seems to be genetically stabilized, and functions in a rhythm that is synchronized to conditions in the breeding areas..."

Dalland, John I. SPECTRAL THRESHOLDS IN THE STARLING (STURNUS VULGARIS). Ph. D. thesis, Columbia U. 45 p. 1958. [From informative abstract in Dissertation Abstracts 19(3).]
Technical study of dark adaptation and color sensitivity of starling eye. Based mainly on tests with live birds.

Davis, John. (Hastings Reservation, Carmel Valley, Calif.) SINGING BEHAVIOR AND THE GONAD CYCLE OF THE RUFOUS-SIDED TOWHEE. Condor 60(5): 308-336, 5 figs. Sept. 1958.
Detailed histological and behavioral analysis of correlation between gonadal cycle and singing.

Gunston, David. DO BIRDS HAVE A SENSE OF SMELL? Aud. Mag. 60(6): 280-281, 310, 2 photos. Nov.-Dec. 1958.
Present view is that a great majority of birds have little or no sense of smell, but that many individual species do, including ravens, peregrines, pigeons, magpies, some owls, and some crows. It is theorized that the faculty of smell in birds is reduced and retained for tasting only, but that they cannot smell as mammals do. N. Z. kiwi is an exception; its nostrils are on the end of its bill and it hunts successfully by scent.--L. F. Stickel.

Hohn, E. O. (U. Alberta, Edmonton.) OBSERVATIONS ON THE BEHAVIOR OF CERTAIN ARCTIC BIRDS. Arctic 11(2): 93-101. 1958.
Calls, displays, and other habits of 14 species of birds observed near mouth of Anderson R., N.W.T. Hohn believes that yearling ♂♂ of Clangula hyemalis did not pair and seldom succeeded in mating; they appeared to spend the nesting season largely at sea but at least to some extent close to breeding grounds. Willow ptarmigan were abundant in 1955, but many were not breeding. There was no evident lack of food or nest sites, so perhaps high density inhibited breeding.

Kramer, Stanley Z. RESPIRATORY RESPONSES TO LIGHT IN BIRDS. Ph.D. thesis, U. Pa. 138 p. 1958. [From informative abstract in Dissertation Abstracts 19(4).]
Experiments with pigeons demonstrated that light can induce increase in ventilation for as long as 1.25 hours. There is no correlation between increases in either ventilation or oxygen consumption and overt activity.

Lovell, Harvey B. (U. Louisville, Ky.) BAITING OF FISH BY A GREEN HERON. Wilson Bul. 70(3): 280-281. Sept. 1958.
A wild green heron that was accustomed to being fed by people learned to use bits of bread to attract fish, which it caught and ate. The bird exhibited a surprising amount of flexibility and adaptability in its use of the bait. [This seems another strong piece of evidence that birds are not limited to stereotyped, inherent behavior patterns.]

Marshall, A. J., and D. L. Serventy. (St. Bartholomew's Med. Coll., U. London, Eng.) THE INTERNAL RHYTHM OF REPRODUCTION IN XEROPHILOUS BIRDS UNDER CONDITIONS OF ILLUMINATION AND DARKNESS. J. Exp. Biol. 35(3): 666-670, 1 pl. of 4 figs. Sept. 1958.

Olsson, Viking. (Axvägen 2F, Valdemarsvik, Sweden.) DISPERSAL, MIGRATION, LONGEVITY AND DEATH CAUSES OF STRIX ALUCO, BUTEO BUTEO, ARDEA CINEREA AND LARUS ARGENTATUS / A STUDY BASED ON RECOVERIES OF BIRDS RINGED IN FENNO-SCANDIA. Acta Vertebratica 1(2): 87-189, 23 figs. 1958. 20 Sw. kr., paper, from Nordiska Museet & Skansen, Stockholm.

In English. Detailed analysis and presentation of data from 3189 band recoveries from birds selected for different habits and behavior: (1) tawny owl, a typically resident bird; (2) herring gull, previously considered to be non-migrant and straying; (3) buzzard, true migrant, individuals gathering and leaving at the same time; (4) heron, true migrant, time and place of departure scattered. Abrasion and loss of bands was insignificant except for herring gulls; their bands lost about 5% of weight each year; risk of loss began at 6-7 yrs. Among the principal findings: (1) Some wanderings of young birds were merely early migration. Others were dispersal movements, probably important in colonizing new areas, that were made by resident birds (owl) as well as by migrants (herons, buzzards). Food need was the stimulus. Herring gulls did not wander in this way. In n. populations, travels were predominately northward; in s. populations they were southward. It is believed a cline may exist. (2) Swedish herring gulls are true migrants. Their colonization of Swedish lakes is believed to be of recent date. Birds that have colonized Finnish lakes are believed to be descendants of passing White-Sea gulls. (3) Differences are shown in migratory habits of Buteo b. vulpinus and B. b. buteo; principally that the former migrates earlier and quicker and that the young do not return to their n. range until their 2nd summer. (4) Life tables are presented. Av. expectation of further life for adults: tawny owl, 2.3 yrs.; herring gull, 2.8 yrs.; heron, 5.0 yrs.; buzzard, 5.4 yrs. Calculated mortality was shown to be well balanced by calculated numbers of young birds that annually survived to become fully fledged.--L. F. Stickel.

Steen, Jon. (U. Oslo, Norway.) CLIMATIC ADAPTATION IN SOME SMALL NORTHERN BIRDS. Ecology 39(4): 625-629, 4 figs. Oct. 1958.

Summary: "The oxygen-consumption and body temperature of six species of northern small birds have been measured throughout the whole night with temperatures ranging from +25 to -25°C. When exposed to cold during the night, newly-caught birds were found to be unable to maintain their body temperature but they adjusted themselves to a new and lower one. This nocturnal body temperature, which was kept constant for the rest of the night, was the same at all air temperatures below the critical one. Birds kept at -10°C for about one week maintained a normal heat balance even during the night in severe cold, thus showing the usual pattern of metabolic cold acclimation. It seems therefore as if many free living birds are not normally exposed to cold during the night, but rather seek some sort of protective shelter. The nocturnal hypothermia may be regarded as a sort of 'second defence' against abnormally cold weather."

Stewart, Olus J. (U. Ky., Lexington.) A BIRD'S INBORN NAVIGATIONAL DEVICE. Trans. Ky. Acad. Sci. 18(4): 78-84. 1957. [From Biol. Abst. 32(10).]

Evidence is presented to show that a bird's feathers become charged negatively in flight. It is hypothesized that the bird detects the reaction between the earth's magnetic field and those of the electric currents generated by the electrons on its feathers by the sense of feeling and that these reactions serve as directional signals to guide the bird through unfamiliar territory to its desired destination.--R. H. Weaver.

Sturkie, Paul D. (Rutgers U., New Brunswick, N. J.) A SURVEY OF RECENT ADVANCES IN POULTRY PHYSIOLOGY. Poultry Sci. 37(3): 495-509. May 1958.

A review paper by the author of "Avian Physiology." It takes up blood chemistry, blood pressure, energy metabolism and digestion, and endocrinology. The review pertains mostly to work published since 1953. About 90 references.

Tabor, Teresa. THE 24-HOUR RHYTHM OF ACTIVITY IN THE COMMON BUZZARD (BUTEO BUTEO L.) AND IN THE ROUGH-LEGGED BUZZARD (BUTEO LAGOPUS L.) IN DIFFERENT CONDITIONS OF LIGHTING. Acta Biol. Exptl. 17(1): 5-26. 1956. [From Biol. Abst. 32(11).]

No abstract.

von Haartman, Lars. ADAPTATION IN HOLE-NESTING BIRDS. Evolution 11(3): 339-347. 1957. [From Biol. Abst. 32(10).]

A number of analogous adaptations occur in hole-nesting birds. Their main causes are the safe nesting sites and the severe competition for them. Competition has caused certain characteristics in behavior. The safety of the nesting site has caused development of frequent polygamy, lack of cryptic color in the eggs, large clutch size, and slow development of eggs and young. In primary (phylogenetically old) hole-nesters, the adaptations are much more clearly developed than in secondary hole-nesters. The number of subspecies shows a positive correlation to clutch size. This may be due to stronger selection in species with more offspring, and/or the fact that species with large clutches are relatively often non-migratory.--Auth. abst.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

McCandless, James B. A FIELD GUIDE TO THE BIRDS OF PUERTO RICO. I.A.U. Press, San German, Puerto Rico. 68 p. 1958. $2.00. [From review by Amy Clampitt, Aud. Mag. 60(5).]

"...designed solely for use as a supplement to Peterson's 'Field Guide to the Birds,' this little book contains a brief outline of bird finding in Puerto Rico followed by a systematic listing of 190 species occurring on that island. Of these, 137 are birds described by Peterson, and the appropriate page reference in his guide has been given, together with a summary of its status in Puerto Rico. For the 53 others which do not regularly occur in the U. S., Dr. McCandless has provided a paragraph on field marks for identification. There are no illustrations."

Richards, Tudor. A LIST OF THE BIRDS OF NEW HAMPSHIRE. Aud. Soc. N. H., New Hampton, N. H. 16 p. 1958? $1.00; 75¢ in lots of 12 or more. [From review by Vera H. Hebert, Mass. Aud. 43(2).]

Annotated list. "...the list shows the trends and actual changes that have taken place in the period since the list by Dr. Glover M. Allen in 1903. About 340 species are treated in the main text which is followed by a supplementary list of 11 exterminated birds and 50 accidental visitors."

BIRDS--POPULATIONS & FLUCTUATIONS

Bond, Gorman M., editor. (US Natl. Mus., Wash. 25, D. C.) TWENTY-SECOND BREEDING-BIRD CENSUS. Aud. Field Notes 12(6): 444-461, 4 photos. Dec. 1958.

Quantitative reports on 34 actual censuses of breeding birds, chiefly from forested areas of e. U. S. Apparently the 1958 nesting season was one of the worst on record in e. U. S. Reasons suggested here differ, but severe winter of 1957-58 probably was one factor.

Bruns, Herbert. (Inst. Angewandte Vogelkunde, Hamburg, 13, Germany.) THE DENSITY OF BIRDS IN SPRUCE FORESTS. Ornith. Mitt. 9(12): 241-253, illus. 1957. [From Biol. Abst. 32(10).]

In German. The author reports on some aspects of a continuing study into the relationships between bird population densities and various forest types. This report deals with spruce woods and has an economic basis in insect control. Population density estimates are given for a varying number of years from 1952-57 for songbirds on 19 experimental plots ranging in size from 1 to 250 hectares. The highest densities were found on 1-hectare plots. Increasing the number of nesting sites (by artificial nest boxes) decidedly increased the number of birds, even in the interior of some of the larger plots where songbirds had not previously nested. However, there seemed to be an optimum number of nest boxes for a plot and increasing the number above that point resulted in little further increase in the number of birds. When the same number of nest boxes was added to large and small plots, the percentage of utilization was greater on large plots. Plot location in relation to the species' distribution range was important as attempts to increase population density along the fringe of a species' range generally failed.--Frank Bronson.

Dennis, John V. (17 Liberty St., Nantucket, Mass.) ARE WARBLERS DECREASING? A POSTSCRIPT. Aud. Mag. 60(6): 287, 310. Nov.-Dec. 1958.

Supplement to original series (see WR 91 p. 79). Discusses population changes of small birds in 1957 as noted at Nantucket banding station. As to the question posed by the title, "I have, as yet, no satisfactory answer. The one fairly positive statement I can make is that, over the last few years, population gains seem to have more than made up for the losses."

MacArthur, Robert H. (U. Pa., Philadelphia.) POPULATION ECOLOGY OF SOME WARBLERS OF NORTHEASTERN CONIFEROUS FORESTS. Ecology 39(4): 599-619, 10 figs. Oct. 1958.

Technical study of mechanisms by which 5 species of Dendroica are able to breed in the same areas. "First, it is shown that density dependent events play a large role in controlling the populations of the species. Second, a discussion of the general ecology of the species (food, feeding zones, feeding behavior, territoriality, predators, and mortality) is presented... Third, the habits of the different species in different seasons are compared to see what aspects of the general ecology are invariant and hence characteristic of the species. Some observations on the species' morphology are discussed in the light of these characteristics... Finally, a wood-to-wood comparison of species abundances, relative to the important constituents of their niches as determined in the earlier stages, is presented..." Conclusion: "Thus, of the five species, Cape May warblers and to a lesser degree bay-breasted warblers are dependent upon periods of superabundant food, while the remaining species maintain populations roughly proportional to the volume of foliage of the type in which they normally feed. There are differences of feeding position, behavior, and nesting date which reduce competition. These, combined with slight differences in habitat preference and perhaps a tendency for territoriality to have a stronger regulating effect upon the same species than upon others, permit the coexistence of the species."

Preston, Frank W. (Preston Labs., Butler, Pa.) ANALYSIS OF THE AUDUBON CHRISTMAS COUNTS IN TERMS OF THE LOGNORMAL CURVE. Ecology 39(4): 620-624, 1 fig. Oct. 1958.

The Christmas counts, and similar counts, have an essentially lognormal distribution curve with 2 exceptions: too many rare species are represented, owing to the competitive nature of the count, and numbers of many common species are underestimated.

BIRDS--ECONOMICS, CONTROL, MORTALITY

Brander, T. POOR EXPERIENCE WITH THE PROTECTION OF JACKDAW IN SOUTHWESTERN FINLAND. Suomen Riista 12: 100-109, 3 photos. 1958.

In Finnish with English summary on separate mimeo. sheet. Jackdaws are fully protected by a law of 1923. They have increased greatly in sw. Finland and have become a major pest. It is urged that legal protection be removed. Among the faults of the birds: noise, crop damage, destruction of waterfowl eggs, annexation of nesting holes of desirable birds (increased damage to electric poles by black woodpecker--Dryocopus martius--has followed loss of nesting sites to daws, and in some areas the woodpeckers and the goldeneye have been exterminated), removal of tow from timber walls, defacement of buildings, blocking of chimneys, damage to searchlights and paint in shipyards.

Dennis, John V. DEATH ON THE HIGHWAY. Aud. Mag. 60(4): 159. July-Aug. 1958.

Highway deaths of birds normally are not excessive. Doves and other birds have learned to feed safely on road margins. Some groups of birds, especially owls, suffer heavy highway mortality; pheasants and coots are among these birds. Truly heavy highway kill of small birds, however, seems to occur at times of cold and starvation when hundreds of birds are doomed to die anyway; good evidence of this is given.

BIRDS--ECONOMICS, CONTROL, MORTALITY--Continued

Gibson, Arthur W. (Sentinal Labs., Springfield, Ill.) HOW TO USE ENTANGLANTS FOR BIRD CONTROL. Pest Control 26(7): 21-22, 1 fig. July 1958.
Entanglants are sticky gums or jellies used to repel birds from roosting on treated surfaces. There are several proprietary compounds of secret composition on the market, but there is almost no literature on them. All of them tend to harden throughout or on the surface and therefore lose their effectiveness with time. Nevertheless, the author believes they have a place in bird control if properly used. He gives a number of suggestions as to how to apply them to different surfaces such as ledges, roofs, and trees; and he tells how to prepare different surfaces for the reception of entanglants. He recommends applying entanglants, in strips, to all possible roosting places and removing and renewing them when necessary.

BIRDS--PARASITES AND DISEASES

Buss, I. O., R. D. Conrad, and J. R. Reilly. (State Coll. Wash., Pullman.) ULCERATIVE ENTERITIS IN THE PHEASANT, BLUE GROUSE AND CALIFORNIA QUAIL. J. Wildl. Mgt. 22(4): 446-449, 1 photo. Oct. 1958
Following treatment with sulfaquinoxaline sodium and moving to a range, there was a decrease in an unusual mortality from ulcerative enteritis in young game-farm pheasants. Blue grouse (Dendragapus obscurus) confined to a pen died of ulcerative enteritis. No pathogenic bacteria or protozoans were found. Streptomycin therapy was unsuccessful. Ulcerative enteritis occurred in a flock of wild Calif. quail (Lophortyx californicus) confined by a canyon. Mortality was about 73%. Bacteriological examination was negative. The importance of density to ulcerative enteritis is indicated and suggests that the coaction of these 2 factors could be highly significant in control of certain wild populations of gallinaceous birds.--Helen E. D. Conrad.

Gray, M. L. (Mont. Vet. Res. Lab., Bozeman, Mont.) LISTERIOSIS IN FOWLS--A REVIEW. Avian Diseases 2(3): 296-314. Aug. 1958.
Useful review; 72 references cited.

Hubben, Klaus. (Sch. Vet. Med., U. Pa., Philadelphia.) CASE REPORT--ASPERGILLUS MENINGO-ENCEPHALITIS IN TURKEYS AND DUCKS. Avian Diseases 2(1): 110-116, 2 photos. Feb. 1958.

Rothschild, Miriam. THE BIRD FLEAS OF FAIR ISLE. Parasit. 48(3/4): 382-412, 10 figs. Nov. 1958.
Comprehensive report based on examination of 5,000 birds of 78 species at the British bird station, Fair Isle. Six species of fleas were found. Author discusses seasonal infestation rates, rate of infestation of avian groups, double and triple infestations, sex ratios of fleas, host preferences, and related matters.

Stafseth, H. J. (Mich. State U., E. Lansing.) ADVANCES IN KNOWLEDGE OF POULTRY DISEASES OVER THE PAST FIFTY YEARS. Poultry Sci. 37(4): 741-775. July 1958.
Review article. About 300 references cited.

QUAIL

Bookhout, Theodore A. (Dept. Wildl. Mgt., U. Mich., Ann Arbor.) THE AVAILABILITY OF PLANT SEEDS TO BOBWHITE QUAIL IN SOUTHERN ILLINOIS. Ecology 39(4): 671-681, 1 map. Oct. 1958.
Abundance and duration of availability of seeds was studied in 9 land-use areas. Work was done in 2 years, 1 wet, 1 dry. Results are presented quantitatively. Seasonal differences in availability are discussed. Duration of availability depended on number of seeds produced, durability of seed coat, and response to moisture. Abundance of seed was much lower in the dry year. Drought and early frost were believed to contribute to production of unsound seed. "Little correlation between available plant seeds and frequencies and volumes of seeds taken by bobwhite quail was found. Selective feeding habits by quail

were indicated." Production of quail foods in each land-use type was studied. Permanent cover made the best contribution to the food supply, with woody plants contributing a substantial portion. "Soybeans and corn formed the bulk of seed volume in their respective divisions. Lespedeza and rotation pasture, ranked fourth and fifth, respectively, furnished nearly equal food volumes. Idle plowland, small grain, and hayfields were low in production of food volume, and minor crops supplied a negligible segment."

Brown, Charles P. (N. Y. Cons. Dept.) CAN QUAIL COME BACK? THE BOBWHITE GETS ANOTHER CHANCE IN NEW YORK. N. Y. State Cons. 13(3): 32, 2 figs. Dec.-Jan. 1958-9.

Bobwhites died out across central N. Y. early in this century. Reestablishment was tried with southern quail and game-farm quail. In the last 2 years, quail from Ont., Wis., and Ohio have been released in certain areas (map). They seem to be surviving and breeding. Plans call for discontinuance of stocking in 2 areas to see if increase will continue without more pump-priming.

Davison, Verne E. (Soil Cons. Serv., Auburn, Ala.) A SUMMARY AND RE-CLASSIFICATION OF BOBWHITE FOODS. J. Wildl. Mgt. 22(4): 437-439. Oct. 1958.

"This paper presents an evaluation of bobwhite food plants as to their quality and acceptance, and classifies them as 'choice,' 'inferior,' and 'unimportant.'" Local management should emphasize choice foods that are well adapted to the locality.

DuBose, R. T., L. C. Grumbles, and A. I. Flowers. (Agr. Exp. Sta., Coll. Station, Texas.) THE ISOLATION OF A NONBACTERIAL AGENT FROM QUAIL WITH A RESPIRATORY DISEASE. Poultry Sci. 37(3): 654-658. May 1958.

Study of a serious virus disease of penned quail. The virus appeared to be identical with Olson's quail virus, but not with that of infectious bronchitis. Chickens and turkeys resisted the infection.

Marsden, Halsey M., and Thomas S. Baskett. (U. Mo., Columbia.) ANNUAL MORTALITY IN A BANDED BOBWHITE POPULATION. J. Wildl. Mgt. 22(4): 414-419, 2 graphs. Oct. 1958.

A statistical treatment of 7 years' banding data on a central Mo. refuge population of bobwhites. Age-ratio data from 1546 captures and recaptures indicates an av. annual mortality of 72%, and a calculated life expectancy of 8.5 months. Selectiveness of trapping methods as to age and sex is considered. A longevity record approaching 5 years is reported. Monthly age ratios showed no significant difference in mortality between young and adults after the first Oct. of life. A regression analysis of recaptures is presented as an approach to an indirect calculation of egress. The study provides another source of evidence that the annual mortality of refuge bobwhite populations does not differ from that of hunted populations.--H. M. Marsden.

Murry, Robert E. (La. Wild Life Comm.) PLAN FOR BETTER QUAIL HUNTING. La. Cons. 10(12): 24-26, 4 photos. Dec. 1958.

Management recommendations for pine-timber fields in La.: (1) disk or plow a portion of the field each year, (2) plow or burn a portion of broomsedge roughs to keep them open enough for quail movement, (3) allow haw, persimmon, sassafras, and briars to make clumps, but prevent them from taking over the field, (4) plow fire-lanes to protect good lespedeza areas, (5) disk sandier portions for voluntary stands of good weeds and manage heavier soils for lespedeza, (6) provide woody cover where needed by making brush piles and by protecting natural growth from fire and cattle, (7) native birds will populate good areas; don't waste money on introductions.--L. F. Stickel.

Ripley, Thomas Huntington. ECOLOGY, POPULATION DYNAMICS AND MANAGEMENT OF THE BOBWHITE QUAIL, COLINUS VIRGINIANUS MARILANDICUS (L.), IN MASSACHUSETTS. Ph.D. thesis, Va. Poly. Inst. 1-108 p., 25 figs. May 1958.

Weight data support the idea that the ne. quail is subspecifically distinct, and that quail weights in Mass. have not been changed by introductions. Decline in Mass. quail populations probably resulted from decline of habitat. Populations remained about the same 1952-56, except for some increase in 1954. Quail were heaviest in Jan., lightest in Apr. Movements of individuals were greater in spring than in fall. In an area intensively managed by planting of

annual grains, population rose 30% in 6 months and percentage of young increased. In an expanding insular quail population, summer gains were inversely related to spring densities; a decrease in percentage of young could be attributed to post-nesting mortality. This insular population was maintained by bucket-type feeders at cost of $4.00 per additional bird. Use of such feeders has only limited practical value. Considered ineffective were plantings of shrub lespedezas, planting of cover where not clearly needed, predator control, and refuges. Artificial stocking was considered advisable only for heavily hunted public areas. Best practice was planting of strips of annual grains, with maximum edge, in areas reverting to non-productive condition. This cost about $2.50 per additional bird. Hunting regulations should be liberalized to permit better utilization of the resource.

PHEASANTS

Anon. SHOT OR NOT. Outdoor Nebr. 36(10): 13, 5 photos. Oct. 1958.

285 pheasants killed by cars in Nebr. were fluorscoped. All birds had survived at least 1 hunting season. Ten per cent of the hens and 14 per cent of the cocks carried 1-7 pellets of shot. Data suggest that too many hunters do not confine themselves to legal birds, and that they take too many long shots.

Breitenbach, Robert Peter. FUNCTIONAL AND ANATOMICAL CHANGES DURING REPRODUCTION IN PHEASANTS WITH SPECIAL REFERENCE TO INCUBATION AND BROODING. Ph.D. thesis, U. Wis. 110 p. 1958. [From abstract in Dissertation Abstracts 19(4).]

Conclusions: "Inherent cyclic mechanisms appear to exist in pheasants which affect and control annual fat cycles. The greatest increase in fat stores occurs during reproduction. Incubation and brooding by pheasants results in a rapid loss of body weight, depot fat, and weight of most of the viscera. This loss is much less in birds which do not incubate eggs or brood young. Theoretically this may place incubating birds at a physiological disadvantage in survival and in regaining peak winter weights. Pituitary prolactin levels rapidly rise during early incubation to a high during mid-incubation, which appears to correlate well with acceptance by the hen of newly hatched chicks. The relationship of normal broody activity to prolactin levels and survival is discussed."

Labisky, Ronald F., and James F. Opsahl. A GUIDE TO AGING OF PHEASANT EMBRYOS. Ill. Nat. Hist. Surv., Biol. Notes no. 39. 1-4 p., 23 photos. Sept. 1958.

"...presents a series of photographs illustrating the chronological sequence in the development of pheasant...embryos as an aid to identification of incubation stages of pheasant eggs found in the field. The photographs are accompanied by brief descriptions of the embryonic stages. The identifying criteria are based on prominent external characteristics visible to the unaided eye."

Morgan, Walter. (S. Dak. State Coll., Brookings.) WHITE PHEASANTS AMONG RING-NECKED PHEASANTS IN SOUTH DAKOTA. Wilson Bul. 70(3): 281-284, 1 photo. Sept. 1958.

White but not albino individuals appeared in a game-farm flock. The character proved to be a simple recessive. It would be easy to develop a white strain in captivity. White pheasants appear occasionally in the wild, but have little chance for survival because they are conspicuous. Birds that are heterozygous for white and normal may have somewhat lower embryonic mortality than birds homozygous for normal color, according to limited data.

Osborn, O. H., and B. S. Pomeroy. (Coll. Vet. Med., U. Minn., St. Paul.) CASE REPORT--ISOLATION OF THE AGENT OF INFECTIOUS SINUSITIS OF TURKEYS FROM NATURALLY INFECTED PHEASANTS. Avian Diseases 2(3): 370-372, 1 photo. Aug. 1958.

Wagner, Fred H., and C. D. Besadny. (4454 Hillcrest Dr., Madison 5, Wis.) FACTORS IN WISCONSIN PHEASANT PRODUCTION. Wis. Cons. Bul. 23(12): 3-13, 3 maps. Dec. 1958.

Important summary of Wis. pheasant research and management policy. About half of all cock pheasants stocked in Wis. are bagged--if circumstances are favorable. Most states have returns of only 1/4 or 1/3 of cocks. But even in Wis., stocked birds make up a trivial part of the kill in good pheasant country. Wild birds do the job, except in areas marginal for the species. Do stocked hens produce many young for hunting? Experiments indicated that they produce a few birds, but not enough to have a real effect on kills. Should we, then, shoot hens? Apparently not in Wis., where 80% of cocks are shot each year and young birds make up 90-95% of the kill. Too few breeders would survive. When hen-shooting was tried, the population dropped by half. The state's expensive stocking program adds less to the bag than many people think. Five thousand birds stocked per county works out to about 2 cocks per sq. mi. by hunting season. By comparison, good pheasant areas naturally produce 50-100 cocks per sq. mi. Natural production is what counts. It will never be possible to pen-rear enough birds to make good hunting. Some of the best pheasant states do no stocking. Good pheasant country has good soil, crop farming, and often some form of lowland such as marshes. Dairy country is very poor, and its prevalence is one reason Wis. has no more pheasants. Marshes, however, are exceptionally important to pheasants in Wis. Perhaps their great value is for nesting cover safe from mowing. Drainage may be the greatest threat to pheasants in Wis. Questions of what type of marsh is best, how much marsh is needed, how close together marshes should be, and how they should be managed, are being studied. Meanwhile, a marsh acquisition program is under way. In this program the state will need the cooperation of landowners, hunters' groups, and others if important amounts of pheasant range are to be kept.

Westerskov, Kaj. (Wildl. Div., Dept. Int. Affairs, Wellington, N. Z.) INCUBATION PERIOD IN THE PHEASANT. N. Z. Dept. Int. Affairs, Wildl. Publ. no. 58: 139-151, 2 graphs. Reprint from Emu 58(2): 139-151. May 1958.

"Observations were made of incubation periods in the Pheasant, Phasianus colchicus. Under wild conditions the hen Pheasant of the Ringneck and Blackneck subspecies will hatch her clutch in 23-1/2 days; frequent interruptions of the sitting hen may prolong the period up to 25 days or even longer. Eggs incubated in artificial incubators with no interruptions in the incubation schedule may hatch in 22 days. If eggs are addled a hen Pheasant may sit for 47 days or longer. Eggs of the Mongolian Pheasant (P. c. mongolicus) have a longer incubation period than eggs of the Ringneck and Blackneck Pheasants and crosses between them. Mongolian eggs hatch in 24-25 days, about 24 hours later than the two other subspecies mentioned. Pheasant chicks in a clutch hatch in the course of an hour or two; they are dry in three hours and can leave the nest with the hen after that time. Hatched eggs can easily be distinguished from broken eggs."--Auth. summ.

GROUSE, PARTRIDGE, ETC.

Graham, Samuel A., and George S. Hunt. (U. Mich., Ann Arbor.) A NONCYCLIC RUFFED GROUSE POPULATION NEAR ANN ARBOR, MICHIGAN. J. Wildl. Mgt. 22(4): 427-432, 4 figs. Oct. 1958.

A study of population trends of ruffed grouse on 100 acres of swampland in s. Mich. The study extended from 1927 to 1957. During the first 12 years, observations were made using bird dogs and were not precise. More intensive records were begun in the spring of 1939. Since then a drumming-male census, using the intersection method, has been made annually. The relative stability of the grouse population has been clearly demonstrated. Natural succession, logging, and fire have caused habitat changes and a gradual reduction in grouse numbers has followed.--Authors.

Hornbeck, Gene. BOON TO GROUSE? Outdoor Nebr. 36(10): 18-19, 5 photos. Oct. 1958.

Describes methods used by Harold Malicky of Burwell, Nebr., in his relatively successful efforts to rear prairie chickens in captivity from eggs collected in the wild. Author believes propagation may be needed for future restocking of areas from which the birds have vanished.

Klett, A. T. (N. Dak. Game Dept.) THE EARLY SHARP-TAILED GROUSE SEASON. N. Dak. Outdoors 21(4): 12-14, 1 graph. Oct. 1958.

Summary: "1. A mid-September opening on sharp-tailed grouse is recommended because they mature early and provide the best hunting before they bunch up later in the season. 2. A better sharptail harvest is obtained by opening the sharptail season before the pheasant and waterfowl seasons. 3. The illegal kill of pheasants during the early sharptail season is insignificant when compared to the additional recreation and grouse harvest attained. 4. Under present range and hunting pressure conditions there is no danger of over-hunting sharp-tailed grouse in North Dakota. 5. Better use can be made of our present game supply by considering the characteristics of each species separately when drawing up hunting recommendations."

Kokeš, Otakar, and Eduard Knobloch. THE PARTRIDGE / ITS LIFE HISTORY, PROPAGATION AND HUNTING (Koroptev / Jeji Zivot, Chov a Lov). Scientific Text Publishers, Prague. About 250 p., illus. 1947. Translation by Canadian Wildlife Service, 278 p., mimeo., 20 offset pl. 1958. Size 8.5 x 14 x 1 in., spiral binder, paper cover. No price stated.

Monographic compilation on biology, management, and conservation of partridge (Perdix perdix) in Czechoslovakia. History of the birds and their hunting is followed by sections dealing with various phases of the biology: size and weight, coloration, sex and age differences, anatomy and physiology, habits and habitat preferences, distribution, migration, reproduction and breeding behavior, food habits, parasites and disease. Analysis of climatic factors through the years and in different localities showed that the great partridge decline in 1940-41 was produced by a combination of unfavorable factors: prolonged snow cover, unusually low temperatures in winter plus high precipitation and low temperatures at the breeding season. Notes are also included on biology and migratory habits of Coturnix quail, chukar, red-legged partridge, francolin, bobwhite quail, sand grouse, and rock ptarmigan. Management practices recommended for Perdix include predator control, provision of shelter through plantings, protection of nests from agriculture, artificial rearing, and winter feeding. Methods of trapping partridges are detailed and illustrated. Final chapters discuss hunting methods, regulation of hunting, and economics of the species from the point of view of food habits and meat value. --L. F. Stickel.

Koskimies, Jukka. SEASONAL, GEOGRAPHICAL AND YEARLY TRENDS IN THE WEIGHT OF CAPERCAILLIE (TETRAO UROGALLUS) AND BLACKGAME (LYRURUS TETRIX) IN FINLAND. Ornis Fennica 35(1): 1-18. 1958. [From Biol. Abst. 32(11).]

See long abst. in Biol. Abst. 32(11).

Matheson, C. (Natl. Mus. Wales, Cardiff.) GAMEBOOK RECORDS OF PHEASANTS AND PARTRIDGES IN WALES. Natl. Lib. Wales J. 9: 287-294. 1956. [From J. Animal Ecol. 27(2).]

"Illustrates by figures from Welsh estate gamebooks the great increase of the pheasant during the nineteenth century, and also compares fluctuations in the partridge bags on different Welsh estates over a long period."

Matheson, C. FURTHER PARTRIDGE RECORDS FROM WALES. Brit. Birds 50: 534-536. 1957. [From J. Animal Ecol. 27(2).]

"Gamebooks from 1866 to 1950 for two estates in Montgomeryshire and Denbighshire are compared. There is considerable correspondence in the fluctuations, and both show a prolonged decrease compared with former times."

Mezhennyy, A. A. THE EFFECT OF STONE GROUSE ON THE ARCHITECHTONICS OF LARCH TREETOPS. Bot. Zh. 42(1): 84-85. 1957. [From JPRS (NY) Report no. 777, from Referat. Zh.--Biol., no. 2, 1958, no. 4916.]

[Apparently "stone grouse" is Alectoris graeca, same species as chukar.] "As a result of clipping of young larch by grouse [in U.S.S.R.], the trees develop with a low, wide and rounded treetop, convenient for grouse feeding. It is noted that clipping of treetops by grouse exerts no influence on larch fruit-bearing. Grouse regularly feed on larches standing singly, but do not clip off young growth at points of massive renewal. This is due to the particular places in which grouse settle: during winter they sleep in snow, for

which a platform is needed free from bushes--such places are found at burnt-over spots where larch trees begin to grow singly. Grouse create characteristic and unusual woodstands on old burnt-over spots in brook valleys."

Peters, Stuart S. (Dept. Mines & Resources, St. John's, Newf.) FOOD HABITS OF THE NEWFOUNDLAND WILLOW PTARMIGAN. J. Wildl. Mgt. 22(4): 384-394, 1 graph. Oct. 1958.

Based on crops, droppings, field observations, and comparison between available vegetation and foods selected. Kalmia angustifolia, a plant not used as food, and which apparently suppresses desirable food plants, is considered a limiting factor in ptarmigan abundance. Also described is plant succession following fires. Possible use of fire in ptarmigan management is suggested.--Author.

Rajala, Paavo. THE CHOICE OF GRINDING STONES BY CAPERCAILLIE, BLACK GROUSE AND PTARMIGAN IN THE LIGHT OF ENCLOSURE EXPERIMENTS. Suomen Riista 12: 89-93, 2 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. These birds all have well-developed gizzards that contain grinding stones to help process heavy plant food. Captive birds selected different sized quartz stones, with these av. preferences: capercaillie (1 ♂), 107.1 mg.; capercaillie (2 ♀♀), 56.3 mg.; black grouse (4 ♂♂), 30.6 mg.; ptarmigan (2 ♂♂, 1 ♀), 107.1 mg. Ptarmigan's preference for much bigger stones for its size is explained by its use of tough-fibered Salix shoots for food. All but the capercaillie ♀♀ increased their intake of stones in the period preceding arrival of continuous snow cover. Av. total individual intake of stone during test period was: capercaillie ♂, 236.7 g., capercaillie ♀, 98.8 g., black grouse ♂, 229.8 g., and ptarmigan, 110.5 g.

Salter, Robert L., editor. WESTERN STATES EXOTIC GAME BIRD COMMITTEE / ANNUAL NEWSLETTER / 1958. 1-9 p. Dec. 1958.

The Committee, once called Western States Chukar Committee, now publishes an annual report and an annual newsletter. Quarterly and semiannual reports were discontinued. The present newsletter is based chiefly on questionnaire returns. It presents tabular data on reproductive success of chukar in 1958, precipitation and food conditions for chukars, estimated fall populations of chukars in 1957 and 1958, hunting regulations for chukars in 1958, results of chukar hunting in 1957, releases of game-farm chukars, and installations of water developments for chukars. It lists the active exotic bird projects of western states and provinces, tells what research needs are considered most urgent, and lists exotics introduced in 1958. The latter are: Barbary partridge in Calif., bamboo partridge and red-legged partridge for game-farm stock in Wash., Reeve's pheasant in Hawaii, and Erckel's francolin in Hawaii.

Seiskari, Pertti. IMPROVING THE HABITAT OF THE HAZEL HEN BY INCREASING ALDERS. Suomen Riista 12: 42. 1958.

In Finnish with English summary on separate mimeo. sheet.

Siivonen, Lauri. (Unicninkatu 45B, Helsinki.) BASIC REASONS FOR TETRAONID LOWS AND THE APPLICATION OF THE RESULTS OBTAINED. Suomen Riista 12: 43-54, 5 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. In the years 1946-56, more moderate temperatures in the pre-laying period of capercaillie and black grouse generally preceded years of population growth; lower temperatures preceded years of population decline. Early appearance of patches of clear ground and available green food may be the significant factor. [For technical account of this work, in English, see Pap. Game Res. no. 19 (WR 91 p. 93).]

Suomus, Heikki. WINTERING OF PARTRIDGE. Suomen Riista 12: 55-62, 7 figs. 1958.

In Finnish with English summary on separate mimeo. sheet. In the winters of 1956-7 and 1957-8, partridges fed primarily (79%) on green forage taken from under snow cover and resorted to seeds when snow cover was difficult to penetrate. Population size declined 41% from Nov. to Mar. and flock sizes decreased.

Westerskov, Kaj. (Wildl. Div., Dept. Int. Affairs, Wellington, N. Z.) THE PARTRIDGE AS A GAME BIRD. N. Z. Dept. Int. Affairs, Wildl. Publ. no. 51: 1-10, 7 figs. Reprint from N. Z. Outdoor 22(12): 12-15. Feb. 1958.

Perdix perdix is being considered for introduction in N. Z. With this in mind, the author presents a brief review of the bird's biology: distribution in Eur. and N. Am., size of kill in various nations and states, edibility, habitats, foods, reproductive capacity, and sporting quality. Introductions into N. Z. have been held up for fear of Newcastle disease. This difficulty can be overcome by obtaining breeding stock from Denmark, where the disease is unknown.

Zwickel, Fred. (Wash. Dept. Game.) NORTH-CENTRAL WASHINGTON GROUSE STUDIES. Wash. State, Game Bul. 10(4): 3-4, 1 photo. Oct. 1958.

Blue, ruffed, and Franklin grouse are the most important upland game birds in parts of Wash. Of these 3 species, blue grouse make up 80% of the bag, ruffed 15%, and Franklin 5%. Franklin grouse are not scarce, but are lightly hunted. Study was directed at blue grouse by use of 2 checking stations, road counts, brood counts, and age ratios. Work was done 1953-57 in Chelan and Okanogan counties. Blue grouse reached peak in 1957, when cover growth was exceedingly good, perhaps as consequence of warm, wet May and warm, dry June. This suggests that better grazing management on breeding areas would help production. Hunter success was a poor index to production. It was influenced by terrain, by time of vertical migration of grouse up to wintering areas, and by proportion of local hunters to city hunters. Production was consistently better in the Chelan Co. area, but weights of grouse were a little higher in the Okanogan Co. area. Over-all proportion of young in fall varied from 54-85% and av. 60%. This meant that 40-50% of the grouse could be shot, as opposed to 5% now shot. Seasons should be liberalized gradually until effect is seen. Sex ratio was close to 1:1, but with slight excess of ♀♀. Av. weights are reported for sex and age groups in both areas. Little information is given on ruffed and Franklin grouse, except that young made up about 60% and 50% of fall populations, respectively.

TURKEY

Bailey, R. Wayne, and C. Eugene Knoder. (W. Va. Cons. Comm.) WHO WANTS A GAME FARM TURKEY? W. Va. Cons. 22(8): 20-23, 4 figs. Oct. 1958.

Tells why stocking pen-reared turkeys is not only ineffective but even dangerous. "The whole art and science of successful wild turkey management rests on two huge pillars of confidence: (1) good, wild stock and (2) adequate range of high quality... Releasing game farm stock is unintelligent tampering..."

Bohl, Wayne H., and Sidney Paul Gordon. (US F&WS, Sacramento, Calif.) A RANGE EXTENSION OF MELEAGRIS GALLOPAVO MEXICANA INTO SOUTHWESTERN NEW MEXICO. Condor 60(5): 338-339. Sept. 1958.

Apparently M. g. mexicana has expanded from Mexico into the Peloncillo Mtns. of Hidalgo Co., N. M. Introductions of M. g. merriami into the nearby Animas Mtns. seemingly failed; habitat in the Animas Mtns. is not like that of merriami range.

Mason, Charles. (N. Y. Cons. Dept.) RETURN OF A NATIVE / THE WILD TURKEY DIGS IN TO STAY. N. Y. State Cons. 13(2): 32-33, 3 figs. Oct.-Nov. 1958.

Turkeys probably disappeared in N. Y. before 1880. Abandonment of poor farms and natural succession gradually made more of the state suitable for turkeys. The big birds moved in from Pa. and others were established by judicious stocking. Minimum requirements for areas to be stocked are: "(1) A semi-wilderness area of at least 3,000 acres, mostly in woods including quite a bit of beech, oak and black cherry of bearing age; (2) snow depths that seldom if ever exceed one foot; (3) surface water available at all seasons of the year." Today turkeys are reported from 118 townships of 20 N. Y. counties (map). Winter feeding stations were discontinued when turkeys did not use them. The severe winter of 1957-58, the worst in a decade, caused some deaths from starvation, but caused no significant population losses. Populations are believed to be at a level where carefully controlled hunting can begin in a year or so--but not in 1958.

DOVES AND PIGEONS

Foote, Leonard E., Harold S. Peters and Alva L. Finkner. (Wildl. Mgt. Inst., Marietta, Ga.) DESIGN TESTS FOR MOURNING DOVE CALL-COUNT SAMPLING IN SEVEN SOUTHEASTERN STATES. J. Wildl. Mgt. 22(4): 402-408. Oct. 1958.

Compares results of call-count censuses of 141 original management routes and 150 randomly selected routes. Within limitations of call-count technique, random routes were chosen after stratification into state strata. Both sets of routes were censused during the regular dove censusing period in 1957 by experienced cooperators who have censused the original management routes since 1951. Results indicate that the original management-route sampling is positively biased, with higher than av. dove-population areas being sampled. Although differences between mean numbers of doves calling on original management routes and randomly selected routes are small, the method of selection of routes to be censused nationally should be revised so that call-count data will have application for both time and area comparisons. Results indicate that stratification by ecological zones is more efficient than either stratification by state strata or completely random sampling. Suggestions are made for revision of the nation-wide call-count sampling.--Authors.

LaPointe, Donald F. (US F&WS, Grand Island, Nebr.) MOURNING DOVE PRODUCTION IN A CENTRAL NEBRASKA SHELTERBELT. J. Wildl. Mgt. 22(4): 439-440. Oct. 1958.

A shelterbelt near Grand Island, Nebr., was selected for intensive study during the 1957 nesting season. It was visited 30 times, Apr. 7-Sept. 15. The median nesting attempt was observed on June 16. Doves preferred Am. elm and ponderosa pine for nesting. 25 out of 98 nesting attempts (26%) were successful. 44 nestlings were banded. Production was approximately 34 doves per acre.--Author.

Murton, R. K. (Ministry of Agr., Tolworth, Surrey, Eng.) THE BREEDING OF WOODPIGEON POPULATIONS. Bird Study 5(4): 157-183, 2 figs. Dec. 1958.

This report of an intensive 2-year study of breeding biology of Columba palumbus should be of comparative value in the U. S. Predation on eggs, chiefly by corvids, is heavier than experienced by relatives in America. Predation on eggs is density dependent--proportionately higher at higher nesting densities. The pigeons are territorial in nesting; probable reason for this spacing-out of nests is reduction of predation.

Sprunt, Alexander, IV. THE SEASONAL POPULATION AND NESTING SUCCESS OF THE MOURNING DOVE IN VIRGINIA. M. S. thesis, Va. Poly. Inst. 1-60 p., 18 figs. Dec. 1957.

Nesting occurred Mar.-Oct. with peak in May. Coniferous trees were preferred nest sites. Of nests studied, 52.2% were partly successful. Actual percentage of success was 47.8. Most serious nest predators were birds. Trichomoniasis was also a factor. Collection of wings indicated that peak of hatch was in mid-June with lesser peak in Aug. Population was highest in late Sept. and then dropped sharply to winter level. The level began to rise in Mar. and rose steadily May-Sept. Mail survey indicated that 10.1% of Va. hunters hunted doves and killed about 317,000 in 1950. Quail, squirrels, and deer were the most popular game animals, in that order. Most important dove foods were corn, 3-seeded mercury, and ragweed.

WATERFOWL

Benson, Dirck, Don Foley, and Lee DeGraff. (N. Y. Cons. Dept.) WHERE IS HOME? N. Y. State Cons. 13(2): 20-21, 2 photos. Oct.-Nov. 1958.

Tells what became of banded, pen-reared redhead ducks released in N. Y. A good many were shot locally, some traveled far away from N. Y. in different directions, and a few returned to breed. Comparative data are given from the mallard stocking program. Mallards apparently behaved more nearly as desired and established good breeding populations in N. Y.

Bezubik, Bernard. SUPPLEMENT TO THE STUDY ON THE HELMINTH FAUNA OF WILD DUCKS (SUBFAMILY ANATINAE). Acta Parasit. Polonica 5(1/12): 177-179. 1957. [From Biol. Abst. 32(11).]

Boyd, Hugh. THE SURVIVAL OF WHITE-FRONTED GEESE (ANSER ALBIFRONS FLAVIROSTRIS DALGETY AND SCOTT) RINGED IN GREENLAND. Dansk Ornith. For. Tidsskr. 52(1): 1-8. 1958. [From Biol. Abst. 32(11).]

In the years 1946-1956, 835 individuals of this species were ringed in W. Greenland, of which 193 were recovered by the spring of 1957. Data on adult survival and the distribution of annual losses are calculated and discussed. The Greenland form of this goose resembles other populations of Anser in the mortality experience of adults and young birds after fledging. For a fuller understanding of the dynamics of the species, further investigations are essential. Continued ringing can be expected to yield valuable results.

Cramp, S. THE CENSUS OF MUTE SWANS, 1955 AND 1956. Lond. Bird Rep. 21: 58-62. 1956 (1957). [From J. Animal Ecol. 27(2).]

There were 173 nests within 20 mi. of London in 1955, and 188 in 1956. The av. density of about 1.5 nests per 10 sq. mi. was much higher than national av. Nests were most frequent along rivers, on park lakes and ponds, and on gravel pits. Non-breeding birds were numerous. Av. clutch, 4.4; young hatched, 4; young reared, 2.4. [This bird is well established in various parts of U. S. Appraisal of its desirability should be made before it is too late to do anything, if needed.]

Cronan, John M., Jr. RHODE ISLAND'S WATERFOWL PROGRAM. R. I. Dept. Agr. & Cons., Div. Fish & Game, Wildl. Pamph. no. 5. 1-40 p., 17 figs. Feb. 1958.

Quantitative data of reference value are included in this informational pamphlet. Tables, graphs, and maps give data on such topics as: recovery sites of black and wood ducks banded in R. I.; brood counts (1951-57) of black duck, wood duck, mallard, and blue-winged teal; R. I. winter populations (1950-57) of baldpates, diving ducks, black ducks, and Canada geese; status of various species of waterfowl in R. I.; representation of waterfowl species in hunters' bags, 1951-56. Numbers of most species are down sharply in the last 5 years, probably because of continuing loss of habitat. Wood duck broods were up a little in 1957, perhaps because of nest boxes that the Department installs and maintains. Unlike most other waterfowl, the baldpate has increased its wintering population in R. I. The text of the pamphlet explains the need for surveys and habitat management and outlines what is done along these lines.

Fritsch, Lee E., and Irven O. Buss. (State Coll. Wash., Pullman.) FOOD OF THE AMERICAN MERGANSER IN UNAKWIK INLET, ALASKA. Condor 60(6): 410-411. Nov. 1958.

Fifty-five mergansers were collected. Stomach contents are reported. Few of the birds had fed on salmon eggs or fry, although these fish are important in the area and had spawned just before or during the collecting.

Grenquist, Pekka. A NESTING BOX FOR THE RED-BREASTED MERGANSER. Suomen Riista 12: 94-99, 4 photos. 1958.

In Finnish with English summary on separate mimeo. sheet. Nesting boxes made from packing cases have been used for decades to protect red-breasted mergansers from crows. A hole is sawed in the middle of the short side of the box. Preferred dimensions of hole are 9 x 11.5 cm. to 12.5 x 12.5 cm., approximately the same as for goldeneye and goosander. Shallow and small boxes, 17-23 cm. high, 28-43 cm. wide and 42-50 cm. long are preferable. Boxes are placed near juniper or other bushes with the opening facing the shore or open country. They also can be placed on the rocky shore where there is heavy vegetation; camouflage and weighting with stones may be desirable. Fifteen of 42 boxes were occupied in 1955; 20 of 86 in 1956; and 20 of 98 in 1957. Forty-five of the occupants were red-breasted mergansers, 2 were tufted ducks, and 1 was a velvet scoter.

Griffee, W. E. (Yeon Bldg., Portland 4, Ore.) NOTES ON OREGON NESTING OF AMERICAN MERGANSER AND BARROW'S GOLDEN-EYE. Murrelet 39(2): 26. May-Aug. 1958.

Use of nest boxes made possible new nesting records for hole-nesting ducks.

Handley, Delmar E. WATERFOWL BAND RECOVERIES FOR OHIO 1939 - 1956. Ohio Div. Wildl., Tech. Bul. no. 3. 1-94 p., 50 maps. 1958.
Text, maps, and tables take up waterfowl species by species, telling where birds banded in Ohio were recovered and where birds recovered in Ohio were banded. Migratory movements revealed by these data are discussed. Also considered are interval between banding and recovery, and time distribution of kill. Av. annual mortality rates are calculated for mallard, black duck, blue-winged teal, and Canada goose. Pages 74-75 report on the fate of 6,584 hand-reared mallards that were released in the wild. "It appears from both the Wisconsin and Ohio studies that hand-reared mallards are relatively sedentary and their recreational value largely local in nature."

Hanson, Harold Carsten. STUDIES OF THE PHYSIOLOGY OF WINTERING AND OF MOLTING CANADA GEESE (BRANTA CANADENSIS INTERIOR). Ph.D. thesis, U. Ill. 125 p. 1958. [From Dissertation Abstracts 19(5).]
Growth and condition of geese wintering on Ill. refuges were determined by periodic sampling of weights of body, pectoral muscles, and various organs as well as by studies of blood constituents, histology of femur, and growth of primary feathers. Comparisons were made also between molting and non-molting geese. Yearling geese weighed about 1 lb. more than immatures and adults about 1/3 lb. more than yearlings. Weights were affected by amount of food available. "...in the fasting goose, muscle tissue must be degraded to provide oxalacetate, the catalyst required for the utilization of depot fats. Adequate protein stores, i. e. muscle tissue, appear, therefore, to be nearly as important as fat stores for survival in time of inadequate food intake. While molt represents a heavy stress, its chief physiological characteristic is a deficit nitrogen balance."

Helminen, Matti. FINNISH LITERATURE ON WILDFOWL 1945-1957. Game Res. Inst., Unioninkatu 45B, Helsinki, Finland. 1-10 p., mimeo. [1958.]
Bibliography of about 225 titles. "The list comprises Finnish books, papers and notes dealing specifically with the Anatidae. Only a few general faunal studies with important references to wildfowl are included. The originally Finnish or Swedish titles are translated into English and the presence of an English or German summary is indicated."

Houston, Stuart. (Yorkton, Sask.) THE DIVING DUCK CRISIS. Blue Jay 16(4): 163-164, 1 fig. Dec. 1958.
Decline in diving-duck populations has been caused by loss of marshes and water areas to drainage, and by over-shooting. Game laws have been geared to puddle ducks. Too little thought has been given to welfare of diving ducks, which nest later and also remain in the marshes, where they are vulnerable. Ducks banded by author near Yorkton were recovered as follows: 28% of canvasbacks, 21% of redheads, 21% of mallards, 14% of pintails, 5% of blue-winged teal. True hunting loss would be approximately double these figures. Editor's comment following article notes that: US F&WS data show 47% canvasback kill; H. A. Hochbaum of Delta Waterfowl Sta. reported that 90% of banded adult ♀ and young canvasbacks are shot each year and that only about 100,000 breeding pairs remain.--L. F. Stickel.

Humphrey, Philip S. (Peabody Mus., Yale U., New Haven, Conn.) DIVING OF A CAPTIVE COMMON EIDER. Condor 60(6): 408-410. Nov. 1958.

Johnson, Donald A. WATERFOWL PRODUCTION AND HABITAT STATUS ON THE LARAMIE PLAINS, WYOMING. M. S. thesis, Colo. State U. 124 p., 18 tables, illus. Mar. 1957.--L. E. Yeager.

Koskimies, Jukka. (Unioninkatu 45B, Helsinki.) JUVENILE MORTALITY AND ITS CAUSES IN THE VELVET SCOTER, MELANITTA FUSCA. Suomen Riista 12: 70-88, 8 figs. 1958.
In Finnish with English summary on separate mimeo. sheet. Summary of results of 1948-57 field studies, which were reported in more detail in papers listed in bibliography. Juvenile mortality in a closely controlled study area was 90-95%. Main direct factors were bad weather and fluctuations in water temperature, as well as predation. Basic reason for poor survival in the outer archipelago, however, is that this bird, originally an inhabitant of inland waters, is not adequately adapted to maritime conditions.

Newcombe, F. L. (N. Z. Wildl. Div., Wellington.) THE CONSERVATION OF WATERBIRDS AND THEIR HABITAT IN NEW ZEALAND. N. Z. Dept. Int. Affairs, Wildl. Publ. no. 52. 1-15 p., 4 photos. 1958.

The story of waterbird decline in N. Z. and a plea for preservation of wetlands. As in U. S., bird decline has been met by hunting restrictions, predator control, and introduction of new species. In N. Z., introduction of mallard has been unfavorable to native grey duck. Habitat is being lost through accelerated drainage programs. The Wild Life Branch has made some preliminary wetland surveys and has persons responsible for liaison and consultation work concerning habitat preservation. As yet, however, the agencies and organizations concerned with land and power development proceed as they see fit.--L. F. Stickel.

Page, C. A. (SW. La. Inst., Lafayette.) ANTIBODY RESPONSE OF THE CANADA GOOSE TO THE NEWCASTLE DISEASE VIRUS. Avian Diseases 2(3): 365-369. Aug. 1958.

Preston, F. W. (Preston Lab., Butler, Pa.) WATERFOWL OF THE WESTERN PENNSYLVANIA SKYWAYS AS PORTRAYED BY THE MIGRANTS AT ONEIDA DAM, BUTLER COUNTY, PA. Ann. Carnegie Mus. 35, art. 7: 77-116, 14 figs. Jan. 1958.

Analysis of observations of spring and fall migrants. Scatter plots and plots of averages show migration duration and peaks for all ducks (1949-52), for numbers of species, and for scaup. Tables show numbers of spring migrants, occurrence of spring and fall migrants in different years, and earliest and latest migration dates. The lake is on the Atlantic Flyway, judging by proportion of black ducks to mallards, presence of swans, and absence of blue geese. Sex ratios show a predominance of ♂♂. The majority of diving ducks, at least, are in flocks predominately of 1 sex, usually ♂. Scaup make up 40% of all ducks. Analysis of numbers of loons present on 38 occasions indicates that they migrate solitarily. "The spring and autumn migrations are 'independent' events and may conveniently be graduated by Gaussian curves. The peaks of the migrations are located, and their standard deviations determined."--L. F. Stickel.

Schlichting, Harold E., Jr. (Central Mich. Coll., Mt. Pleasant.) THE ROLE OF WATERFOWL IN THE DISPERSAL OF ALGAE. Mag. Ducks & Geese 9(4): 16-17, 3 photos. Fall 1958.

Author states that he has good experimental evidence that ducks can transport various micro-organisms on and in their bodies, especially in their bills. Experimental methods, but not results, are described.

Scothorne, R. J. (U. Glasgow, Scot.) HISTOCHEMICAL STUDY OF THE NASAL (SUPRA-ORBITAL) GLAND OF THE DUCK. Nature 182(4637): 732. Sept. 13, 1958.

Technical study of salt gland.

Stewart, Robert E., Aelred D. Geis, and Charles D. Evans. (Patuxent Refuge, Laurel, Md.) DISTRIBUTION OF POPULATIONS AND HUNTING KILL OF THE CANVASBACK. J. Wildl. Mgt. 22(4): 333-370, 15 figs. Oct. 1958.

Canvasbacks breed chiefly in the Interior Plains of w.-cent. Can. and adjacent parts of U. S. Local populations occur in Alaska, n. Yukon, s. B. C., and in n. Rocky Mtns. and Intermontane areas of w. U. S. The major breeding populations occur in aspen parklands and mixed and tall-grass prairies of the Prairie Provinces and the Dakotas. About 80% of wintering canvasbacks are in the e. 1/3 of the U. S. and about 20% in w. U. S. and Mex. The outstanding concentrations are in the Chesapeake Bay area; they are about half the continental population. Other important wintering concentrations are in San Francisco Bay area, Detroit River-Lake St. Claire area, on Mex. Cent. Plateau, and in Miss. Valley coastal area. During migration, the greatest numbers take a route from the prairies and parklands of s.-cent. Can. through the Dakotas, Minn., Wis., and Mich. and se. to the mid-Atlantic states. Secondary flights extend from breeding grounds to Pacific Coast, Gulf Coast, Mex., and elsewhere. Distribution of hunting kill, based on weighted recoveries of banded birds, indicates that about 75% of the kill occurs in the U. S., 24% in Can., and 1% in Mex. The Can. kill is almost entirely in the s. Prairie Provinces and s. Ont. In the U. S. the largest kills are in Calif., Minn., Md., Texas, and N. Dak. For each harvest area, the relative importance of the contribution from

each production area was determined. For most areas, the production from Sask. is most important. Descriptions of the waterfowl surveys that were used, the limitations of the data, and the assumptions made are discussed in an appendix. --R. E. Stewart.

Taylor, Warren Hassel. UTILIZATION, PREFERENCE AND NUTRITIONAL VALUE OF WINTER-GREEN AGRICULTURAL CROPS FOR GOOSE FOOD. M. S. thesis, Va. Poly. Inst. 1-102 p., 24 figs. June 1957.

Plots of alfalfa, crimson clover, ladino clover, Italian rye grass, Wong barley, oats, rye, and wheat were tested at 2 refuges in Va., 1956-57. Both deer and geese grazed the plots. In first year, the plants rating highest in both production and utilization were rye grass, rye, and oats. In second year, the highest in production and utilization were rye and rye grass. Ladino improved in yield and use in second year. Most of the plant species were about equal in nutrient content. No correlation appeared between available nutrients and preference. Preferences of geese and deer were studied in second year by dropping-count lines. Ladino and wheat were highly preferred by both deer and geese. Rye grass was high for geese but low for deer. Crimson clover was medium for geese but low for deer. Oats was high for deer but low for geese. Ladino was the least expensive and was well liked by both deer and geese. Crimson clover and alfalfa were very high in cost and only medium to low in yield and use. Rye grass and grains were low in cost. In all, rye grass seemed best to plant for geese. Grazing by about 6,000 geese did no damage in a normal year, but rather seemed to increase crop yields. The result might have been different in a very wet year. A reasonable amount of deer grazing helped keep plants at a height preferred by geese. Heavy goose grazing, however, may leave plants too short for deer. Geese definitely liked to graze in open areas that were near water and away from trees and brush. Two captive Canada geese could eat all the wheat (4.5-5 in. high) in a pen of 144 sq. ft. in 1 day. These geese produced an av. of 92.2 droppings per goose day.

Tinker, Frank A. AVIAN BOTULISM--THE BATTLE AT BEAR RIVER. Aud. Mag. 60 (3): 116-119, 140, 5 photos. 60(4): 174-177, 6 photos. 60(5): 224-227, 7 photos. May-Oct. 1958.

Three-part article that reviews in popular fashion the history of botulism and the research and management work that has been done to counteract it at Bear River Refuge, Utah.

Webbe, Russell. BRENT GEESE (BRANTA BERNICLA (L.)) IN DENMARK AND THE COLOUR PROBLEM. Dansk Ornith. For. Tidsskr. 52(1): 41-47. 1958. [From Biol. Abst. 32(11).]

Both B. b. hrota and B. b. bernicla occur in Denmark. The dark-breasted birds (H. b. hrota) come to Denmark via the Baltic from Arctic Russian breeding grounds; most of the pale-breasted ones (H. b. bernicla) come from breeding grounds in Spitzbergen via w. coast of Norway. They winter in the same localities; the question of mixing is discussed. An historical review is given of reports of mixing in England and the Canadian Arctic. Scarcity of intermediates seems to indicate some biological discontinuity. Probably the 2 forms evolved separately during glacial period. There seems to be some environmental factor acting around the polar basin and throughout the true arctic and immediate subarctic zone, which affects coloration.

Yancey, R. K., M. M. Smith, L. R. Jahn, and H. J. Miller. WATERFOWL DISTRIBUTION AND MIGRATION IN THE MISSISSIPPI FLYWAY. "A Report by the Technical Section of the Mississippi Flyway Council." 20 p. + 39 figs. 1958. [No indication of place of publication or availability. Believed to be available in small numbers from states of flyway and from authors.]

Extensive aerial surveys in 3 years (1954-57) were made "(1) to determine the chronology of migration for each species of waterfowl and (2) to determine the general fall and winter distribution of each waterfowl species in the Mississippi Flyway states." Maps and graphs show (1) av. numbers of ducks counted in s., central, and n. states on surveys in 3-yr. period, (2) total numbers of ducks counted each year in all areas, and (3) proportion of ducks counted in s., central, and n. states. These data are shown by species for mallard, pintail, green-winged teal, blue-winged teal, gadwall, black duck, Am.

widgeon, shoveler, scaup, ring-necked duck, canvasback, redhead, merganser, goldeneye, ruddy duck, Canada goose, blue and snow goose, white-fronted goose, and coot. Total duck population is graphed by regions and by species. Discussion section tells period and peak of migration, states of greatest abundance, and population trends in the period for the species listed above. It also includes notes on mottled duck and wood duck. Variations between species indicate that successful management must be by species.--L. F. Stickel.

CRANES, RAILS, SHOREBIRDS

Brown, Charles P. (N. Y. Cons. Dept., Delmar.) THE AMERICAN WOODCOCK IN NEW YORK. Kingbird 8(3): 66-71. Oct. 1958.
A short, summary-type article that includes original data from PR studies in N. Y. It discusses migration dates, courtship, nesting, chicks, food, habitats, management, and present status.

Davis, T. A. W. THE BREEDING DISTRIBUTION OF THE GREAT BLACK-BACKED GULL IN ENGLAND AND WALES IN 1956. Bird Study 5(4): 191-215. Dec. 1958.
Although primarily on numbers and distribution, this paper includes sections on habitats, nest sites, foods, and disturbance by man.

Fänge, R., K. Schmidt-Nielsen, and H. Osaki. (Fänge: U. of Lund, Sweden. Schmidt-Nielsen: Duke U., Durham, N. C.) THE SALT GLAND OF THE HERRING GULL. Biol. Bul. 115(2): 162-171, 9 figs. Oct. 1958.
These glands are of primary importance in enabling marine birds to maintain salt balance. In the gull, they are located on top of the skull in the supra-orbital grooves of the frontal bone. This paper describes and illustrates gross and microscopic structure and discusses function.

Mills, D. H. HERRING GULLS AND COMMON TERNS AS POSSIBLE PREDATORS OF LOBSTER LARVAE. J. Fish. Res. Bd. Can. 14(5): 729-730. Sept. 1957. [From Sport Fishery Abst. 3(1).]
Larus argentatus and Sterna hirundo were collected in the Gulf of St. Lawrence when lobster larvae were abundant. No lobster larvae were found in 36 gull stomachs and only 1 in 15 tern stomachs.--From auth. abst.

Norrevang, Arne. ON THE BREEDING BIOLOGY OF THE GUILLEMOT (URIA AALGE (PONT.)). Dansk Ornith. For. Tidsskr. 52(1): 48-74, illus. 1957. [From Biol. Abst. 32(11).]
See abst. in Biol. Abst. 32(11).

Svärdson, Gunnar. BIOTOPE AND BREEDING OF THE BLACK-HEADED GULL. Vår Fågelvärld 17(1): 1-24, illus, map. 1958. [From Biol. Abst. 32(11).]
In Swedish with English summ. See long abst. in Biol. Abst. 32(11).

Uspenski, S. M. THE BIRD BAZAARS OF NOVAYA ZEMLYA. Transl. by J. M. MacLennan. Can. Wildl. Serv., Transl. Russian Game Rep. Vol. 4. 1-159 p., 3 figs. 1958. $1.00, paper, from Queen's Printer, Ottawa.
"Colonial nesting places of Alcidae, gulls and various other sea-birds--the so-called 'bird bazaars'--occupy a considerable portion of the sea coasts in the North and the Far East [of Russia]." These birds are found on the coasts of Canada as well as on those of the USSR. This book contains basic biological facts concerning the birds and proposes measures for their economic management. Ch. I gives general characteristics of the bazaars and their species and then lists and gives census data for the more important bazaars. Brünnich's murre is the most important species; every phase of its biology and natural history is discussed in Ch. II. Data are from the literature as well as from the author's own work. Topics include, in part: behavior; breeding behavior and biology; nesting habitat; sex ratios; egg weights, color, shell thickness, and other characteristics; relationship of sunlight to egg-laying; incubation period and embryological development; food and feeding habits; migration; parasites and disease; survival; enemies. Ch. III provides similar but more limited data for other species: common murres, black guillemots, puffins, dovekies, kittiwakes, and glaucous gulls. Ch. IV discusses economic

utilization. On densely populated ledges, the growth of Brünnich's murre chicks was more vigorous and the chicks were heavier on descent to water than they were on more sparsely populated ledges, apparently because the young birds were kept warm by other birds in the parents' absence. Kittiwakes were considered beneficial for murres: when a population drops below definite limits the murres cease to reproduce, but this density can be created not only by murres but by other birds, especially kittiwakes, so that murres can reproduce at lower densities. When their numbers increase, murres do not have difficulty in re-taking nesting areas from kittiwakes. Management recommendations include enforcement of definite quotas of egg collection or absolute protection as needed, control of glaucous gulls, and reconstruction measures at cliffs to provide new nesting areas and maintain old ones.--L. F. Stickel.

Weidmann, U. (Birkbeck Coll., London, Eng.) OBSERVATIONS AND EXPERIMENTS ON EGG-LAYING IN THE BLACK-HEADED GULL (LARUS RIDIBUNDUS L.). Brit. J. Animal Behaviour 4(4): 150-161. 1956. [From Biol. Abst. 32(11).]

Deals with clutch size, laying pattern, seasonal and daily distribution of egg-laying, and the "Frazer Darling-effect". The black-headed gull is an indeterminate layer. If all eggs were removed within 12 hours after they were laid, protracted laying often occurred. Reducing number of eggs had no effect on egg-laying if one egg was left in nest. By adding eggs several days before gulls laid, it was possible to suppress egg-laying completely or partially. Thus it is not size of clutch but brooding that stops egg-laying. Additional evidence from inspection of 5 ovaries suggests that incubation has an inhibitory influence on growth of follicles and causes them to degenerate if they have not reached a certain stage of maturity. This limits the number of eggs to be laid after the gull has begun to sit.--From auth. summ.

Wills, Richard G. THE DOWITCHER PROBLEM. Passenger Pigeon 20(3): 95-105, 1 map, 1 photo. Autumn 1958 [Jan. 1959].

With Pitelka's work as a base, Wills reviews in some detail the differences between the Am. dowitchers, the question of their specific and subspecific validity, their ranges, and the identification of Wis. specimens.

OTHER BIRDS

Brock, Elbert M. (U. Calif. Field Sta., Hopland.) SOME PREY OF THE PYGMY OWL. Condor 60(5): 338. Sept. 1958.

Some prey items of Glaucidium gnoma at Hopland, Calif. were Microtus californicus, Peromyscus maniculatus, Jerusalem cricket, and Nuttall's woodpecker.

du Plessis, S. S. (P. O. Box 45, Lydenburg, Transvaal.) GROWTH AND DAILY FOOD INTAKE OF THE WHITE-BREASTED CORMORANT IN CAPTIVITY. Ostrich, Dec. 1957, p. 197-201, 2 graphs. Dec. 1957.

Based on study of 5 Phalacrocorax carbo in S. Africa. Includes notes on behavior and food habits. Probably these birds are economically beneficial, at least in the area of study.

Eaton, Stephen W. (St. Bonaventure U., St. Bonaventure, N. Y.) A LIFE HISTORY STUDY OF SEIURUS NOVEBORACENSIS. (WITH NOTES ON SEIURUS AUROCAPILLUS AND THE SPECIES OF SEIURUS COMPARED). Sci. Stud. St. Bonaventure U. 19: 7-36, maps. 1957. [From Biol. Abst. 32(12). No abst.]

Eaton, Stephen W. A LIFE HISTORY STUDY OF THE LOUISIANA WATERTHRUSH. Wilson Bul. 70(3): 211-236, 5 figs., 1 col. pl. Sept. 1958.

Based on study in 3 years at Ithaca, N. Y. Subjects discussed include: variation, arrival dates, territory, flight song, habitat, nests, eggs, incubation, nestlings, fledglings, food, parasitism by cowbird, fat deposition, weights, molts, ectoparasites, comparison of biology of waterthrush with that of ovenbird as described by Hann.

Gollop, J. B. (Can. Wildl. Serv., Saskatoon, Sask.) DO EARED GREBES HAVE DUMP NESTS? Blue Jay 16(4): 151. Dec. 1958.

Evidence that they do.

Griffee, W. E. (Yeon Bldg., Portland 4, Ore.) MORE MICE--MORE OWL EGGS. Murrelet 39(2): 18. May-Aug. 1958.
Much of Ore. had Microtus outbreak in fall and winter of 1957-58. Author found that Bubo v. saturatus, which usually lays as many as 3 eggs in only 1/3 of clutches, laid clutches of 3 in all 7 nests found. B. v. occidentalis commonly lays 2 or 3 eggs per clutch, but during the Microtus upswing, 5 nests had 4 eggs and 4 nests had 3 eggs--and some of the clutches may have been incomplete when observed.

Hawbecker, Albert C. (Fresno State Coll., Fresno, Calif.) ABALONES EATEN BY BALD EAGLES. Condor 60(6): 407-408. Nov. 1958.
Remains of Haliotis were found at an eagle's refuse station in B. C.

Ligda, Myron G. H. (A & M Coll. Texas, College Station.) RADAR OBSERVATIONS OF BLACKBIRD FLIGHTS. Texas J. Sci. 10(3): 255-265, 4 figs. Sept. 1958.
Ring-type radar echoes received morning and evening at Texarkana in summer of 1957 are believed to have represented vast numbers of red-wing blackbirds leaving and arriving at roost on Black Bayou Wildl. Reservation, La., some 30 mi. away. The theory is said to explain the observations completely.

Oeming, A. F. (Sub. P. O. 23, Edmonton, Alberta.) NOTES ON THE BARRED OWL AND THE SNOWY OWL IN ALBERTA. Blue Jay 15(4): 153-156, 3 photos. Dec. 1957.
Gives locality records for barred owl and data on trapping, banding returns, weights, and cyclic behavior for snowy owl. Oeming found that snowy owls fed predominately on mice and other small rodents and makes a plea for their protection.

Quay, Thomas L., and John B. Funderburg, Jr. (N. C. State Coll., Raleigh.) THE CATTLE EGRET IN NORTH CAROLINA. Raven 29(11/12): 115-117. Nov.-Dec. 1958.

Schnell, Jay H. (Mus. Vert. Zool., U. Calif., Berkeley.) NESTING BEHAVIOR AND FOOD HABITS OF GOSHAWKS IN THE SIERRA NEVADA OF CALIFORNIA. Condor 60(6): 377-403, 7 figs. Nov. 1958.
A long, detailed report of nesting and feeding behavior as observed at 1 nest.

Selander, Robert K. (U. Texas, Austin.) AGE DETERMINATION AND MOLT IN THE BOAT-TAILED GRACKLE. Condor 60(6): 355-376, 5 figs. Nov. 1958.
A combination of criteria made it possible to ascertain age of all specimens examined. Data presented here pertain to pterylography, molts, relation of molts to reproductive cycle, cranial ossification, change of eye color, sexual dimorphism, increase in bill length, weight changes in relation to reproductive cycle.

Sprunt, Alexander, Jr., Joseph C. Howell, and Herbert H. Beck. MORE ABOUT FLORIDA BALD EAGLES. Aud. Mag. 60(6): 284-286. Nov.-Dec. 1958.
Further data on decline of bald eagles in e. U. S., and more discussion of the possibility that this decline represents sterility caused by DDT. Authors agree on urgency of studying the situation rigorously before it is too late to do anything.

Valentine, Jacob M., Jr. (US F&WS, Chincoteague, Va.) THE CATTLE EGRET AT CHINCOTEAGUE, VIRGINIA. Raven 29(8): 67-96, map. Aug. 1958.
A long paper on life history and behavior. It is based both on author's observations and material from the world's literature. Major sections deal with local history, local distribution, colors and plumages, general behavior, foods and feeding, range expansion in U. S., migration in U. S. and abroad, reproduction (breeding age, courtship, nesting, nesting success). Thirty-six references.

Anon. ALLIGATORS BIG BUSINESS IN FLORIDA. Fla. Wildl. 12(5): 4. Oct. 1958.
In the year 1956-57, professional hunters took about 17,695 alligators for a profit of $341,237. One gator 17 ft. long was reported, but av. was a bit over 7.5 ft. Price av. $2.50 per ft. of hide. On size basis, 29% of take was 6 ft.; 26%, 7 ft.; 18%, 8 ft.; 10%, 9 ft.; 6%, 10 ft.; 3%, 11 ft.; 3%, 12 ft.; and 2%, 13, 14, 15 and 17 ft. Alligators and crocodiles over 6 ft. long may be taken under permit June-Jan. in certain areas of Fla.

Bentley, P. J., A. K. Lee, and A. R. Main. (U. Western Australia.) COMPARISON OF DEHYDRATION AND HYDRATION OF TWO GENERA OF FROGS (HELEIOPORUS AND NEOBATRACHUS) THAT LIVE IN AREAS OF VARYING ARIDITY. J. Exp. Biol. 35(3): 677-684, 1 map. Sept. 1958.

Bragg, Arthur N., and Maurice Brooks. (U. Okla., Norman.) SOCIAL BEHAVIOR IN JUVENILES OF BUFO COGNATUS. Herpetologica 14(3): 141-147. Oct. 1958.
"One of us witnessed an eruptive mass migration in the northwestern prairies, with a strong northward trend. The other found a consistent tendency to aggregate in limited areas in central Okla. whereas another species did not. In neither case was any correlation with environment observed... Dense populations of juveniles appear to react to each other's presence by sometimes migrating extensively or locally with a strong directional trend. At other times they aggregate without migration."

Chapman, B. M., and R. F. Chapman. A FIELD STUDY OF A POPULATION OF LEOPARD TOADS (BUFO REGULARIS REGULARIS). J. Animal Ecol. 27(2): 265-286, 10 figs. 1958.
"An ecological study of the leopard toad, B. regularis, was made in the Rukwa Valley, Tanganyika Territory. Movement and growth were studied by marking and recovery and monthly samples were dissected." Other topics include: how toads found pool, numbers at pool, response to weather, croaking, breeding, growth, food, changes in fat bodies and gonads with season and age, Bidder's organ.

Christensen, Poul Agerholm. (S. African Inst. Med. Res., Johannesburg.) SOUTH AFRICAN SNAKE VENOMS AND ANTIVENOMS. S. African Inst. Med. Res., Johannesburg. 129 p., illus. 1955. [From Biol. Abst. 32(10).]
The scope of this monograph is broader than the title implies. It is an excellent model for venom research, and a bibliography of more than 400 titles enhances its value. The author lists 46 spp. of poisonous snakes from the Union of South Africa. He chiefly discusses venoms of the dozen or so medically important species. Topics include toxicity for animals, effects on organ systems and tissues, venom enzymes and enzyme inhibitors. Physical and chemical properties of Cape Cobra (Naja flava) and Puff Adder (Bitis arietans) venoms are discussed in detail. Methods of producing, purifying, and concentrating antivenom serum at the S. African Inst. Med. Res. are described and critically evaluated by experiment. In vitro and in vivo tests for potency of antivenoms are described. Of particular interest are the experiments on paraspecific neutralizing effects of antivenoms. The final section deals with snakebite in man in South Africa, including incidence, symptoms, and therapy. There is a brief account of folk remedies and therapeutic uses of venom. This book is an important one for all students of biological toxins.--S. A. Minton, Jr.

Duellman, Wm. E., and Albert Schwartz. (Wayne State U., Detroit 2, Mich.) AMPHIBIANS AND REPTILES OF SOUTHERN FLORIDA. Bul. Fla. State Mus., Biol. Sci., 3(5): 181-324, 28 figs. Dec. 1958. $1.63, paper, from Fla. State Mus., Seagle Bldg., Gainesville.
Synopsis: "The 85 species of reptiles and amphibians known to occur in southern peninsular Florida and the Florida Keys are treated systematically. The discussion for each species includes data on variation, ecology, life history, habits, and distribution. The definition of geographic races in southern Florida has been accomplished only after extensive analyses of the variation encountered throughout the peninsula. [Seven ssp. are placed in synonymy.] The area of study is broken down into six major habitats; the distribution of the species in these habitats is analyzed. Ideas on the origin and relationships of the herpetofauna of southern Florida are assayed on the basis of a knowledge of the history of the peninsula and Florida Keys and on what is known of the relationships of the component species of the herpetofauna."

Fox, Wade, and Herbert C. Dessauer. (La. State U. Sch. Med., New Orleans.) GROWTH RATES IN CAPTIVE MALE GREEN ANOLES. Herpetologica 14(4): 196-197. Dec. 1958.

Gehlbach, Frederick R. (Cornell U., Ithaca, N. Y.) ANNOTATED RECORDS OF SOUTHWESTERN AMPHIBIANS AND REPTILES. Trans. Kansas Acad. Sci. 59(3): 364-372. 1956. [From Biol. Abst. 32(11).]
Data pertaining to food habits, life history, ecology and distribution are presented for 10 amphibians and 44 reptiles from Kansas, Texas, New Mexico, Arizona, and Colorado.--F. R. Gehlbach.

Goin, Coleman J. (U. Fla., Gainesville.) COMMENTS UPON THE ORIGIN OF THE HERPETOFAUNA OF FLORIDA. Quart. J. Fla. Acad. Sci. 21(1): 61-70. 1958.
Discusses faunal origins and endemism in relation to geological history and paleontological evidence.

Goin, Olive B. (U. Fla., Gainesville.) A COMPARISON OF THE NONBREEDING HABITS OF TWO TREEFROGS, HYLA SQUIRELLA AND HYLA CINEREA. Quart. J. Fla. Acad. Sci. 21(1): 49-60. 1958.

Gosner, Kenneth L., and Irving H. Black. (Newark Mus., 43 Washington St., Newark 4, N. J.) NOTES ON LARVAL TOADS IN THE EASTERN UNITED STATES WITH SPECIAL REFERENCE TO NATURAL HYBRIDIZATION. Herpetologica 14(3): 133-140, 2 figs. Oct. 1958.
Analysis of characteristics of americanus and fowleri larvae and discussion of distribution and hybridization of these toads in N. J.

Johnson, Richard M. A BIOGEOGRAPHIC STUDY OF THE HERPETOFAUNA OF EASTERN TENNESSEE. Ph.D. thesis, U. Fla. 231 p. 1958. [From Dissertation Abstracts 19(5).]
Distributional study of 19 species of salamanders, 15 anurans, 8 lizards, and 22 snakes. Problems of variation and differentiation are discussed. There are 52 extraneous forms: 19 with northern affinities, 21 with southern affinities, and 12 with western affinities. There are 30 intraneous forms, 13 endemic forms. An apparently anomalous restriction of southern amphibians to mountain provinces is attributed to climatic conditions, especially high summer rainfall, on the lower slopes. Four herpetofaunal areas are proposed on the basis of vegetation, climate, and herpetofaunal distribution; the areas are not coincident with physiographic features.

Kaplan, Harold M. (S. Ill. U., Carbondale.) MARKING AND BANDING FROGS AND TURTLES. Herpetologica 14(3): 131-132, 1 fig. Oct. 1958.
Turtles were marked with numbered aluminum bands attached through 2 holes bored in margin of carapace. Frogs were marked with numbered aluminum toe bands (butt-end bird band, #1242, size 2.5). Even better for marking frogs was to scarify skin of upper abdomen to form numbers and then to put India ink in the grooves. Scarification does not penetrate through entire skin. These ink marks have remained on frogs for more than 3 months.

Kennedy, Joseph Patrick. THE BIOLOGY OF THE EASTERN FENCE LIZARD, SCELOPORUS UNDULATUS HYACINTHINUS. Ph.D. thesis, U. Texas. 141 p. 1958. [From Dissertation Abstracts 19(5).]
Biological and population data from a 2-yr. mark-and-release study on a 4.5-acre tract in Polk Co., Texas. There were about 20 lizards per acre in both 1956 and 1957. About 6% of a sample of 192 young reached one year of age; 11 of 48 adults survived one year; maximum recorded age was 28 mo. Males had larger home ranges than ♀♀ and were polygamous. Natural history data include: breeding, gestation period, growth (mature at 1 yr.), autotomy of tail, molting (1st molt 32 days after hatching; 5 or 6 molts per yr.), food habits, predators, injuries and recoveries.

Meacham, Wm. Ross. FACTORS AFFECTING GENE EXCHANGE BETWEEN TWO ALLOPATRIC POPULATIONS IN THE BUFO WOODHOUSEI COMPLEX. Ph.D. thesis, U. Tex. 139 p. 1958. [From Dissertation Abstracts 19(5).]

On the basis of field collections supplemented by laboratory crosses and backcrosses, it was concluded that woodhousei and fowleri intergrade freely over a narrow but extended north-south zone in Texas. Probably they should be regarded as subspecies. The contact is a secondary one that is explainable on the basis of fragmentation of a formerly homogeneous population during the Pleistocene.

Mosimann, James E. (U. of Montreal, Quebec.) AN ANALYSIS OF ALLOMETRY IN THE CHELONIAN SHELL. Revue Canadienne de Biologie (Montreal) 17(2): 137-228, 34 figs. June 1958.

A long mathematical analysis of growth and form. The paper should be of value to workers who are technically concerned with taxonomy or adaptations of turtles, and to those interested in allometric methods.

Proctor, Vernon W. (Texas Tech. Coll., Lubbock.) THE GROWTH OF BASICLADIA ON TURTLES. Ecology 39(4): 634-645, 3 figs. Oct. 1958.

Pyburn, Wm. F. (Arlington State Coll., Arlington, Texas.) SIZE AND MOVEMENTS OF A LOCAL POPULATION OF CRICKET FROGS (ACRIS CREPITANS). Texas J. Sci. 10(3): 325-342, 5 figs. Sept. 1958.

Capture-mark-release studies were made near Austin, Tex., Oct. 1952-June 1953. The fall population of a small pond (112' x 79') and its surroundings was estimated to consist of about 1100 frogs. Frogs that were caught as often as 7 times showed an affinity for 1 or more particular places in the pond. Distance traveled did not correlate well with number of captures or with time between captures. Rainy weather stimulated activity and travel. Activity increased with temperature. Frogs bred from Feb. to May. Young frogs first appeared in May. Adult frogs made up a very small part of the population in June. Collections included about 2 ♂♂ to 1 ♀, but supplementary data showed that the difference probably was due to differences in behavior of the sexes in the breeding period.--L. F. Stickel.

Richards, Lawrence P. (Yosemite Natl. Park, Calif.) SOME LOCALITY RECORDS OF YOSEMITE HERPS. Yosemite Nat. Notes 37(9): 118-126, 4 photos. Sept. 1958.

New park locality records for many species. A following article (p. 127-128), "A revised amphibian and reptile key," by John D. Cunningham, provides for identification of species known from the park.

Riemer, Wm. J. VARIATION AND SYSTEMATIC RELATIONSHIPS WITHIN THE SALAMANDER GENUS TARICHA. U. Calif. Publ. Zool. 56(3): 301-390, 24 figs. Sept. 1958. $2.00, paper, from U. Calif. Press, Berkeley.

A thorough study of variation in structure and coloration of the western newts. Taxonomy and relationships are discussed. Forms recognized are T. g. gramulosa, T. g. mazamae, T. t. torosa, T. t. sierrae, and T. rivularis. Life history and ecology are summarized.

Schmidt-Nielsen, Knut, and Ragnar Fänge. (Duke U., Durham, N. C.) SALT GLANDS IN MARINE REPTILES. Nature 182(4638): 783-785, 2 figs. Sept. 20, 1958.

"...an extrarenal mechanism for salt excretion is present probably in all four orders of marine reptiles... The secretion derives from head glands which resemble the salt glands of marine birds, both in structure and function."

Sexton, Owen J. (Wash. U., St. Louis, Mo.) THE RELATIONSHIP BETWEEN THE HABITAT PREFERENCES OF HATCHLING CHELYDRA SERPENTINA AND THE PHYSICAL STRUCTURE OF THE VEGETATION. Ecology 39(4): 751-754, 6 figs. Oct. 1958.

Tanner, Wilmer W. (Brigham Young U., Provo, Utah.) HERPETOLOGY OF GLEN CANYON OF THE UPPER COLORADO RIVER BASIN. Herpetologica 14(4): 193-195. Dec. 1958.

Description of area and list. Area is of special interest in view of planned developments.

Thomas, L. A., C. M. Eklund, and Wm. A. Rush. (Rocky Mtn. Lab., Hamilton, Mont.) SUSCEPTIBILITY OF GARTER SNAKES (THAMNOPHIS SPP.) TO WESTERN EQUINE ENCEPHALOMYELITIS VIRUS. Proc. Soc. Exp. Biol. & Med. 99(3): 698-700. Dec. 1958.

"...garter snakes are susceptible to infection with WEE virus. This is the first evidence, to the best of our knowledge, that a virus which is an important parasite of avian and mammalian hosts can infect a cold-blooded vertebrate and cause viremia of high titer and long duration."

Tinkle, Donald W. (Texas Tech. Coll., Lubbock.) EXPERIMENTS WITH CENSUSING OF SOUTHERN TURTLE POPULATIONS. Herpetologica 14(3): 172-175. Oct. 1958.

Describes several efforts to census turtles in rivers by means of catching by hand or traps, and by both removal and marking and recapturing. Some tentative population estimates are reported. Tinkle believes that with refinements of technique and development of new techniques, it will be feasible to make population estimates of river turtles in relatively short periods.

Toner, G. C. (Highland Grove, Ont., Can.) RATTLESNAKES IN CANADA. Bul., Fed. Ont. Nat., no. 82: 10-14, 1 photo. Dec. 1958.

Popular discussion of distribution, general habitats, appearance, and other matters pertaining to rattlesnakes in Canada. Information on first aid for snake bite is taken from Gloyd.

Wasserman, Aaron O. (City Coll. New York, N. Y. C.) FACTORS AFFECTING INTERBREEDING IN SYMPATRIC SPECIES OF SPADEFOOTS (GENUS SCAPHIOPUS). Evolution 11(3): 320-338. 1957. [From Biol. Abst. 32(10).]

Adjacent populations of Scaphiopus couchi and S. holbrooki hurteri in Texas are prevented from interbreeding by differences in soil preference, couchi occurring on calcareous loam and hurteri on sandy soils. Introgression is probable in areas supporting both species and both soil types if the topography has been disturbed by man. Two such areas are known in Texas. Laboratory hybridization experiments indicate that viable offspring result only if the female parent is couchi and the male hurteri. Hybrid males are completely sterile in backcrosses to hurteri; a few viable offspring are produced in backcrosses to couchi. Indirect evidence suggests greater fertility in hybrid females.--Auth. abst.

Wilhoft, Daniel C. (MVZ, U. Calif., Berkeley.) THE EFFECT OF TEMPERATURE ON THYROID HISTOLOGY AND SURVIVAL IN THE LIZARD, SCELOPORUS OCCIDENTALIS. Copeia 1958(4): 265-276, 8 figs. Dec. 1958.

After discussing variation in height of thyroid epithelium with season and with temperature, author concludes that "although Sceloporus occidentalis has an optimal temperature near that of certain endotherms, constant exposure to this temperature is detrimental in that death occurred as a result of this exposure and that it is essential for this ectotherm to have periods of relief from such temperatures."

FISHES

Hubbs, Carl L., and Karl F. Lagler. LIST OF FISHES OF THE GREAT LAKES AND TRIBUTARY WATERS. Mich. Fisheries no. 1: 1-6. Oct. 1957.

Revised list of scientific and common names for all groups from family through subspecies. Not annotated.

Slastenenko, E. P. (U. Toronto, Ont., Can.) THE DISTRIBUTION OF FRESHWATER FISHES IN THE PROVINCES AND THE MAIN WATER BASINS OF CANADA. Bul. Shevchenko Sci. Soc. (Toronto) 1(6): 3-11. Feb. 1958.

Systematic list with indication of occurrence in each province as well as Great Lakes, Atlantic, Pacific, and Arctic oceans.

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